Attachment 3-1

Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs)

Eco-SSL Standard Operating Procedure (SOP # 1): Plant and Soil Invertebrate Literature Search and Acquisition

OSWER Directive 92857-55

November 2003

This page intentionally left blank

OVERVIEW

Currently, there is a lack of clear guidance in setting terrestrial effect thresholds when conducting risk assessments. Without an EPA-approved, peer-reviewed, ecologically-based terrestrial effect database, the process to develop thresholds is problematic both to EPA, other federal agencies, states, and concerned private parties. Identification of published toxicity studies on invertebrates, microbial processes and plants is a key step in the derivation of benchmarks. The purpose of the Task Group 4, Standard Operating Procedure Number 1: Literature Search and Acquisition (referred to as TG4-SOP#1) is to document procedures used to identify and acquire potentially relevant toxicology literature for use in setting ecological soil screening levels. The literature search strategy is designed to locate worldwide terrestrial toxicity literature that includes the effects of chemicals of concern on terrestrial soil-dwelling invertebrates and plants. The literature acquisition process is designed to ensure timely acquisition of relevant publications.

LITERATURE IDENTIFICATION

Potentially relevant literature for developing ecological soil screening levels (Eco-SSLs) is identified by examining hard copies of relevant journals, bibliographies and guidance publications and through the use of a comprehensive computerized literature search strategy. These procedures are designed to locate worldwide terrestrial toxicology literature that includes the effects of specific toxic substances with an emphasis on exposure via soil.

Paper-based Literature Identification

The paper-based literature identification process includes the scanning of relevant review article bibliographies and key journals held in the U.S. EPA, National Health and Ecological Effects Research Laboratory (NHEERL), Mid-Continent Ecology Division-Duluth (MED-Duluth) library holdings. Identification of literature from review bibliographies and guidance documents is not limited by publication year. If the citation includes a chemical of concern and an identified species group, the publication is acquired.

Review Articles

The following review articles, specifically dealing with developing soil screening levels were identified by Task Group 4:

> Efroymson, R. A., M. E. Will, G. W. Suter II, and A. C. Wooten (1997) Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. ES/ER/TM-85/R3, Oak Ridge National Laboratory, Oak Ridge, TN: 128 p.
>
> Efroymson, R. A., M. E. Will, and G. W. Suter II (1997) Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision. ES/ER/TM-126/R2, Oak Ridge National Laboratory, Oak Ridge, TN: 34 p.

Canadian Council of Ministers of the Environment (1997) Canadian Soil Quality Guidelines for Copper: Environmental and Human Health. CCME Documents, Winnipeg, Manitoba: 82 p.

Canadian Council of Ministers of the Environment (CCME) (1997) Canadian Soil Quality Guidelines for Pentachlorophenol: Environmental and Human Health. CCME Documents, Winnipeg, Manitoba: 52 p.

Canadian Council of Ministers of the Environment (CCME) (1997) Recommended Canadian Soil Quality Guidelines. CCME Documents, Winnipeg, Manitoba: 185 p.

Gibson, E., D. Strudwick, and P. Walker (1997) National Framework for Ecological Risk Assessment of Contaminated Sites. Victorian EPA for Environment Australia, Kingston, Australia: 45 p.

Crommentuijn, T., M. D. Polder, and E. J. Van de Plassche (1997) Maximum Permissible Concentrations and Negligible Concentrations for Metals, Taking Background Concentrations into Account. Rep. No. 601501 001, National Institute of Public Health and the Environment, Bilthoven, The Netherlands: 260 p.

The initial focus of the paper-based literature identification effort will be on these guidance publications, but any bibliography articles identified in literature searches will be acquired and placed in the queue for identification of potentially relevant literature.

The following steps will be undertaken when identifying potentially relevant literature from manual searches of review publications:

- Bibliographies will be reviewed and potentially applicable literature will be marked for acquisition. All markings will be placed on the original publication.

- The citations for all potentially applicable articles are data entered into an electronic reference database (ECOTOX InProcess - a ProCite bibliographic database) using procedures outlined in Attachment A.

- The review article which was the source of the citation is noted in the InProcess database (see Attachment A).

MED-Duluth Library Journal Holdings

Selected journals in the MED-Duluth library are searched quarterly for articles relevant to any MED-Duluth database. *The focus of the MED-Duluth library is aquatic toxicology, but some of the journals do present results from terrestrial toxicology studies.*

The following steps will be undertaken when identifying potentially relevant literature from manual searches of MED-Duluth library holdings:

- The journal issues that have been scanned for applicable literature will be marked with an "EC" in the upper right hand corner of the cover page.

- All applicable citations are entered into the InProcess file and duplicate citations are

deleted. All remaining citations are marked for Copy Request with date and forwarded to EPA for photocopying.

- After articles are photocopied, they are skimmed using Eco-SSL acceptance criteria (See 'Eco-SSL Acceptance Criteria' section below) and entered into the InProcess bibliographic database using procedures outlined in Attachment A.

The following journals are examined (NOTE: *not all of these journals are relevant to terrestrial toxicology but they are routinely scanned as part of the ECOTOX effort*):

Aquatic Toxicology
Archives of Environmental Contamination and Toxicology
Bulletin of Environmental Contamination and Toxicology
Canadian Journal of Fisheries and Aquatic Sciences
Chemosphere (added 1989)
Ecotoxicology and Environmental Safety
Environmental Biology of Fishes (added 1994)
Environmental Pollution
Environmental Toxicology and Chemistry
Freshwater Biology (added 1994)
Journal of Environmental Biology
Journal of Environmental Quality (added 1997)
Journal of Fish Biology (added 1989)
Journal of Freshwater Ecology (added 1994)
Journal of Great Lakes Research (added 1994)
Journal of the North American Benthological Society (added 1994)
Limnology and Oceanography (added 1994)
Water Air and Soil Pollution
Water Research

Computerized Literature Searches

Online searches are performed using the DIALOG, SilverPlatter or Ovid commercial database vendors. Task Group 4 has identified several databases that will be the focus of Eco-SSL literature searches.

- AGRICOLA database (http://www.nal.usda.gov) provides a strong agricultural focus that has strict indexing codes for both toxicity and soil organisms.

- BIOSIS database (http://www.biosis.org/) provides a strict taxonomical indexing system. BIOSIS recently (1998) began adding Chemical Abstract Service (CAS) Registry numbers.

- CA Search database (http://www.cas.org/) provides a strict chemical indexing system, but lacks a taxonomical indexing system.

In addition, the searches will be supplemented using the following literature abstracting databases:

- Toxline database, provided through SilverPlatter PolTox1 is available on CD-ROM at MED-Duluth. Used in searches performed prior to 9/30/99. DIALOG databases (Pollution Abstracts, Toxline and NTIS) are used for searches performed after 10/1/99

- Toxnet (http://igm.nlm.nih.gov/) provides a free web browser interface system, but has a limit to the number of search terms allowed (current version allows nine search terms).

- Current Contents: Agriculture, Biology & Environmental Sciences, using OVID, Version 3.0 software at MED-Duluth provides timely supplemental citations for publication years 1995 to present.

Development of Literature Search Strategy

Literature search strategies are developed iteratively with each section of terms examined using different criteria. The search strategies may include the following: category codes, chemical terms, species specific terms, publication years, and exclusion terms. Attachment B provides detailed summary of the literature search strategy.

Category Codes

Category codes are used within DIALOG databases to group documents by subject or topic. By specifically selecting category codes relevant to the Eco-SSL effort, the literature search output should result in a more focused data set. The Eco-SSL literature search strategy (Attachment B) includes a summary of category codes for each DIALOG database selected.

Chemical Terms

The Eco-SSL Steering Committee identified a list of chemicals (Table 1) as the initial focus of the Eco-SSL effort.

Table 1: Eco-SSL Chemical List

Organics	Metals	
DDT and metabolites	Aluminum	Iron
Dieldrin	Antimony	Lead
Pentachlorophenol	Arsenic	Manganese

Table 1: Eco-SSL Chemical List		
Organics	**Metals**	
TNT	Barium	Nickel
total PAHs	Beryllium	Selenium
total PCBs	Cadmium	Silver
TPHs	Chromium	Vanadium
RDX	Cobalt	Zinc
	Copper	

- A comprehensive list of chemical terms and CAS Registry numbers was developed by evaluating various standard reference manuals (See Attachment C).

- Task Group 4 recommended that the chemical list focus on soluble salts, but that it include the generic metal form. Task Group 4 also recommended that the chemical search list not include oxides.

- Task Group 4 recommended that PCBs and TPHs be placed on hold until further notice.

A complete listing of chemical terms defined for use in Eco-SSL literature searches is provided in Attachment B.

Species Specific Terms

The effort under TG4-SOP#1 covers two major terrestrial species groups: soil invertebrates and plants. Search terms were defined by species grouping (see Attachment B) using the following procedures.

- Initial terms were provided to Task Group 4 and modifications were made based on their input.

- A test search of the organism specific terms intersected with the chemical terms and category codes was conducted. Brief outputs of citations were downloaded to examine effectiveness of the search strategy. If a large percentage (>60%) of non-applicable citations were identified, Task Group 4 was consulted on additional terms to include or terms that could be used to exclude non-applicable hits.

- All search terms are documented as to testing that was conducted and results observed.

- All exclusion terms are documented as to the testing that was conducted and the number of potentially applicable citations that would be excluded if the term is used. If a high percentage of applicable citations (>10%) would be missed by using the exclusion term,

the term is not included in the search strategy. (NOTE: *exclusion terms are those that are added at the end of the search as a NOT term*; e.g., ((Zn AND plant) NOT aquatic)).

Publication Year

The Eco-SSL Task Group 4 computerized literature searches will focus on publications years 1988 to present. Using these search results, for each chemical and species group (plant or invertebrates) citation results were analyzed, and additional expanded literature searches (all pre-1988 publication years) were conducted for all chemical and species groups for which less than twenty citations had been identified to-date. Table 2 identifies the chemical and species groups meeting this criteria.

Table 2

Chemical	Species Group
Aluminum	invertebrate
Antimony	invertebrate and plant
Arsenic	invertebrate
Barium	invertebrate and plant
Beryllium	invertebrate and plant
Chromium	invertebrate
Cobalt	invertebrate
Iron	invertebrate
Manganese	invertebrate
Nickel	invertebrate
Selenium	invertebrate
Silver	invertebrate
Vanadium	invertebrate and plant
Dieldrin	plant
DDT/DDD/DDE	plant
PCP	plant
RDX	invertebrate and plant
TNT	invertebrate and plant

Conducting the Literature Search

Instructions for performing searches and defining BIBLIOLINKS output format for DIALOG, SilverPlatter and Ovid are found in Attachments D, E and F respectively. The following procedures are to be followed when conducting the literature search using an electronic abstracting database system.

- All chemicals will be searched within a single search strategy.
- An attempt will be made to search all databases at the same time, allowing for removal of duplicate entries across the various databases prior to downloading citations.
- Each species term grouping (invertebrate, plant) will be conducted as a separate search to reduce the number of records downloaded in a single search and to allow for the use of more specific search strategies.
- Task Group 4 must approve any modification to the search strategy prior to conducting a search.
- The strategies used for all searches are saved and downloaded electronically to avoid the possibility of typographical errors.
- Any modifications to the literature search strategy are examined by a second person before conducting the search.
- Copies of all search strategies and results (number of hits) are saved to be included in the report to EPA (see 'Analysis of Search Results' section below).
- All data retrieved from a computerized literature search are transferred to a temporary ProCite database file using BIBLIOLINKS software and procedures according to the specifications provided for each commercial database.

Identification of Potentially Applicable Publications

The temporary ProCite bibliographic file containing the computerized search results is given to a reviewer for identification of publications to be ordered. Each citation is marked with appropriate codes denoting potential applicability. Potentially applicable Eco-SSL citations are marked as "P" (plant - PHYTOTOX database), or "T" (invertebrate - TERRETOX database). Items applicable to other MED-Duluth database efforts are so noted, even if not the focus of the search. Some items may be applicable to more than one database, or there may not be sufficient information to determine applicability. In these instances, all applicable initials are marked on the search result. All potentially applicable articles are ordered through photocopy or interlibrary loan requests. The following procedures are used to determine applicability for

ordering of the literature:

- Items marked as applicable for the Eco-SSL effort must at least have the potential for meeting the basic requirements for coding; i.e., paper includes a chemical stressor identified in Table 1, appears to report toxic effects associated with the chemical stressor, and affected species/process is a terrestrial plant or invertebrate.

- Review articles and publications that document study methods are marked for acquisition.

- Many studies are not relevant to the Eco-SSL efforts. The reject categories presented in Attachment G are used to assist in making decisions of applicability.

- When a determination of potential applicability is questionable (i.e., cannot be determined from the information provided), the article should be marked for ordering. The determination of applicability will be made once the paper is received.

- The first author of each clearly applicable and possibly applicable citation is highlighted to indicate publications to be ordered.

- Field studies using chemical mixtures are marked as potentially relevant.

- All citations that have been marked by the reviewer as potentially applicable are electronically transferred from the temporary ProCite file to the InProcess ProCite file.

LITERATURE ACQUISITION

To expedite literature acquisition, potentially applicable citations are either photocopied from the MED-Duluth library holdings or ordered through the MED-Duluth Library using the OCLC Interlibrary Loan procedures. Prior to acquiring publications, a check is made of all ECOTOX bibliographic files to ensure that the paper is not already available in the ECOTOX filing system. Once all duplicates have been eliminated, the acquisition process is initiated.

Photocopying of MED-Duluth Journal Articles

Articles identified as held in the MED-Duluth library holdings, either through the scanning of MED-Duluth journals holdings as described above, or identified through the scanning of review bibliographies or computerized literature searches, are photocopied in order to expedite acquisition. In addition, publications acquired through the MED-Duluth OCLC Interlibrary Loan procedures may need to be photocopied and returned to the lending library. Prior to photocopying articles, MED-Duluth library staff are contacted to ensure compliance with existing copyright laws.

Ordering Publications using OCLC/Interlibrary Loan (ILL)

If the publication is not available to be photocopied through the MED-Duluth library holdings, it is ordered through the MED-Duluth library using the OCLC/ILL procedures. Relevant publications are downloaded from the InProcess ProCite database file and provided to the MED-Duluth library staff in an electronic file format. Attachment H summarizes the procedures used to create the electronic OCLC/ILL request. The InProcess bibliographic file is updated with information regarding the order status following procedures outlined in Attachment A.

ANALYSIS OF SEARCH RESULTS

After the publications have been ordered, a summary is prepared for each manual and electronic search to provide an estimate of the effectiveness of the procedures used. In addition to analyzing the results, the search terms are evaluated as to their effectiveness in identifying potentially relevant literature. The extent of analysis following a search is determined by need for changes (success rate) and EPA requests. Some keywords from appropriate literature are added to the list of keywords for possible inclusion in future searches, and some keywords from inappropriate literature are added to the list of keywords for possible exclusion from future searches. Analysis of reject categories may be used to help determine possible exclusion terms or search terms which are too broad and should be omitted. Possible changes of terms are further analyzed by the Eco-SSL Task Group 4, and may or may not be included in future searches.

The report to EPA following each search should include the following:

- date of search
- database or journal searched
- dates covered: CD-ROM date and/or publication years specified
- total number of hits
- number of applicable hits
- percentage of applicable hits
- number and percentage of applicable hits which are new, after elimination of duplications
- results of any changes tested: number of hits added or subtracted compared to the search without the change, and number of those hits which are applicable
- recommendation of whether to add or change terms in the search strategy
- a copy of the search strategy with numbers of hits shown

Searches should be summarized using the forms are provided in Attachment I. Attachment I contains a list of frequently cited journals that contain data for soil invertebrate and plant toxicity. This journal listing was used to determine the journals that should be used in the Current Contents search strategy.

Between searches further analysis is performed to determine:

- the best databases to search
- how frequently searches should be performed
- the most effective search strategy

It is important to remember that a search will not likely result in 100% precision. And, despite the searcher's best efforts, a search may not produce 100% retrieval. Development of the most effective search strategy is an on-going effort and care must be taken to document procedures and results as they are attempted and completed.

ECO-SSL ACCEPTANCE CRITERIA

As publications are received via the ILL/OCLC and photocopying processes, they are screened for general acceptability for use in developing soil screening levels. The purpose of applying acceptance criteria is to exclude test results that are incompatible with the intended purpose of setting soil screening levels. In Attachment 3-2, evaluation criteria will be applied to each test record in order to assess the level of confidence associated with using the data in developing Eco-SSLs. The acceptance criteria should exclude test results that are not likely to be useful, but potentially useful test results should not be excluded. Therefore, the acceptance screening process should ensure that the minimal data requirements needed to set Eco-SSLs are included in the publication, but is not an evaluation as to the quality of test procedures or appropriateness of the publication for use in setting soil screening levels.

The following procedures are used in evaluating papers based on acceptance criteria defined by Task Group 4:

- Each paper is individually evaluated. The publication is skimmed, and specific questions associated with the acceptance criteria (see Attachment J) are answered.

- On the “Literature Acceptance Criteria Checklist” form (Attachment J), enter the unique InProcess location number in the box marked "InProcess Reference Number".

- If multiple "Literature Acceptance Criteria Checklist" forms are required for a publication, identify unique experimental design characteristics in the "Experimental Design" box provided in Attachment J.

- For each acceptance criterion, an appropriate answer is entered on the "Literature Acceptance Criteria Checklist" form (Attachment J):

- Enter a ‘Y’ (yes) if the author(s) presents sufficient information in the paper to conclude that the answer is positive.

- Enter an ‘N’ (no) if the author(s) presents sufficient information in the paper to conclude that the answer is negative.

- Enter a ‘U’ (unknown) if the author(s) did not present sufficient information to answer either affirmatively or negatively. This instance will occur when the authors have (a) referred to a method for details regarding the criteria or (b) the authors do not directly address the issue in the paper.

- “OK” is entered into the InProcess database EcoSSL Status data field (line #30) if all acceptance criteria have a positive response.

- If one or more acceptance criteria have a negative response, a NO is placed in the InProcess file under EcoSSL Status data field (line #30), the code(s) associated with each negative criteria (see Attachment A; Table 5) and a corresponding note is data entered into the InProcess database. For example, if the exposure is carried out on filter paper, a NO is placed in line #30 with a note media: filter paper. If there is more than one reason for rejecting the publication, each reason will be noted.

- If there are no negative responses to the acceptance criteria, but the answer to one or more criteria is unknown, the code "UNKN" is entered into the InProcess database file under EcoSSL Status data field (line #30) .

- The appropriate code(s) (see Attachment A; Table 2) identifying the applicable database(s) (e.g., PHYTOTOX or TERRETOX) is entered into the InProcess bibliographic file DATABASE field.

- A copy of the completed Literature Acceptance Criteria Checklist form(s) is attached to the back of the publication.

- Papers with affirmative answers to all acceptance criteria questions are forwarded to reviewing staff for immediate data abstraction and encoding.

- Papers with responses of 'N' or 'U' to any of the acceptance criteria questions are filed in the ECOTOX file room. These papers may be useful to other MED-Duluth database efforts.

ATTACHMENT A: Instructions for BIBLIOLINKS, Formatting and Data Entry in ECOTOX ProCite InProcess File

I. Access Bibliolinks II software to transfer records to ProCite.

A. Select "File", "Open Download File".

1. Select the drive and directory that contains the search output file.
2. Select the correct file.
3. Click on "OK".

B. After the search output file has been loaded into Bibliolinks II, select the destination ProCite database. Choose one of the following:

1. "Create New Database"
2. "Select Existing Database" (This will prompt you to a list of existing database; select one.)
3. A list of recently used databases may be displayed, if this includes your database you may select it using this list.

C. Select a "Configuration File" to direct the transfer of records. Use the following transfer configurations for these databases:

Database	Configuration (database format, if needed)
DIALOG	DIALOG.CFG
OVID	REPRINTOVD.CFG (MEDLINE)
SILVERPLATTER	DIALOG.CFG (MEDLINE)

D. Click on "Start Transfer".

1. If necessary Bibliolinks II will ask you to once again select a destination database. If this occurs verify database selection and continue.

E. For a clean transfer, provide a search output file with only the citation information, no search headers or summaries. Once the transfer has begun, Bibliolinks II may ask you what to do with certain fields it does not recognize in the download file. You may target the information to a specific field in the ProCite database. Or you may choose to ignore the unrecognizable fields and continue downloading.

F. When the transfer is complete, you will see the Transfer Complete dialog box.

1. You may view the transfer log.
    a. Click in “Show Log”.
    b. The transfer log will be displayed.
2. To keep a copy if the Transfer Results log, click on “Save As” on the Transfer log screen.
    a. The Choose Directory and Name for New File dialog box will appear; select directory.
    b. Name the file in the “File Name” text box.
    c. Click “OK”. You will return to the Transfer Results Screen.
3. If you don’t want to view or save the log, click OK on the Transfer Complete screen.
4. To finish, click “Done”.

G. You may now exit Bibliolinks II by using the File Menu.

1. To leave Bibliolinks II without starting ProCite, select “Exit”.
2. To leave Bibliolinks II and start ProCite, select “Exit to ProCite”. This will transfer you to the destination database you identified.

H. To combine search outputs from various databases into the primary bibliographic data file, copy the applicable records from the searches into the primary file. The new records are inserted at the end of the existing file so as to not disrupt the record numbering of existing records.

Use the Duplicate Records feature in ProCite to eliminate duplicate citations. However, the Duplicate Records feature is only partially successful in identifying duplicates. Additional verification of duplicate records is conducted by sorting the records first by Author Field and conducting a visual review of duplicate authors, checking to see if the titles and/or sources are the same. A second verification is conducted by a Citation Field sort. Even after the verification process, duplicates may exist due to the variable database citation source format. A final check for duplicates is conducted during the applicability review, data review and filing processes.

The final editing steps include: 1) globally change the citation entries to the "ECOTOX workform"; 2) move any misplaced fields to correct locations; and 3) globally enter the search database name and date (e.g., POLTOX 2-99) in the Source (ProCite field number 44).

II. To open the InProcess (ECOTOX *in process file*) Database in ProCite 3.4:

a. Double click on the *ProCite Icon*. ProCite will open to the most recently used file. If this is not the InProcess file, click on *File* and *Open*.

b. Double click on:
    i. *PROCITE3*
    ii. *INPROCES*
    iii. *INPROCES.DAT*

c. Every personal computer will need a one time set up for viewing standard entry screens and workforms.

i. Select *view*, click on *configure record list* , mark to show records and click on *OK*.

ii. Select *edit*, click on *preferences*, click on *directories*. Detail the following directories:

DATABASE FILE PATH:	N:\procite3
WORKFORM PATH:	N:\procite3\forms
OUTPUT STYLE FILE PATH:	N:\procite3\styles
LISTS FILES PATH:	N:\procite3\lists

iii. Highlight a record. Select *view,* click on *configure edit record*, mark to show all *fields* and *toolbars* are selected.

d. Select *'N:\PROCITE3\STYLES\ECOTOX.OUT'* for an Output Style.

2. To enter InProcess Data:

a. Click on *Database* and *New Record (F9)*.
b. Select the *"ECOTOX"* workform.
c. Enter data in the applicable fields:

i. Write the RECORD # in GREEN ink on the lower right corner of the citation card.
ii. Use the TAB key to move between fields.
iii. To enter *author information (01)*, enter last name followed by comma and initials. The author names are separated by forward slashes (//). Example(s):

Felsot,A.S.//Bhatti,M.A.//Mink,G.I.
Felsot,A. S. =Jr.//Bhatti,M.A.=Jr.
Felsot,A.S.=Jr.//
Felsot III,A.S.//

iv. *Titles (04)* should be entered using the bibliographic format standard
v. To select a *journal name (09)*,
(1) Click on *Edit*, Click on *Insert Term*, Select journal list from the *(N:\PROCITE\LISTS\AQDL1JRN.LST)* file.
(2) Enter the first letter of the journal name and use the pg/up and pg/down keys and arrow keys to locate.
(3) Double click on *Insert Term* and *Close*.
vi. To add a journal name to the journal list ,
(1) Select *File* and *Open*.
(2) Open file: *N:\PROCITE3\LISTS\AQDL1JRN.LST*.
(3) Click on *Add* and enter the abbreviated journal name (without periods). Follow the BIOSIS standard to determine the correct abbreviation.

(4) Click on *OK* and *Close* the file.

vii. To enter a book or report use the *journal name (09)* field.

viii. Enter the *year (20*), *volume (22)*, *issue identification (24)* and *page numbers (25)* in the next fields.

ix. Enter *status: order date/ data file (38)* information. This information includes a code and date information and should be entered using the following format: Auth/10-9-97//

The status and data file drop menu can be found on *N:\procite3\lists\status.lst*, see Table 1.

Table 1. Status codes and descriptions

STATUS CODES	STATUS CODE DESCRIPTIONS
$/date	Ordered from commercial source
$ (no date)	To be sent as commercial order
ARCHIVE	Paper will not be obtained
Auth/date	Ordered as author request card
Auth (no date)	To be sent as author request
Copy Request/date	Ordered as photocopy request
Copy Request (no date)	To be sent as photocopy request
EVAL /date	Citations that need evaluation (for citation verification, locating full publication, citation or source)
HOLD-P /date	PHYTOTOX (P) paper not being ordered
HOLD-T /date	TERRETOX (T) paper not being ordered
LITBIB	Literature Bibliography datafile
METHFILE	Methods datafile
NON-APPLICABLE	Rejected paper, not retained
OL/date	Ordered as Interlibrary Loan (ILL) request
OL (no date)	To be sent as ILL request
SKIMMED	Skimmed for all applicable citations
STATUS CHECK /date	Library check on status of receiving publication

x. To select a *database descriptor (39) and database (40)*,

(1) Click on *Edit*, Click on *Insert Term*, Select database code file *(N:\PROCITE\LISTS\DATABASE.LST)*, see Table 4.

(2) Select the appropriate database for the database field (40) This data field will only contain AQ, P, or T.

(3) Double click on *Insert Term* and *Close*.

(4) Follow the above instructions for the database desciptor field (39) if descriptor is known. Use the descriptors that are noted for IP field number 39 as noted in Table 2.

Table 2. Database codes and descriptions.

IP FIELD	DATABASE CODES	DATABASE CODE DESCRIPTIONS
40	AQ	AQUIRE
40	P	PHYTOTOX
40	T	TERRETOX
39	L	LITBIB
39	M	METHFILE
39	T-AVIAN	TERRETOX BIRDS
39	T-BEES	TERRETOX BEES
39	T-DOM	TERRETOX DOMESTIC
39	T-FLY	TERRETOX LABORATORY FLY
39	T-FORE	TERRETOX FOREIGN PAPER
39	T-HERP	TERRETOX HERPS
39	T-MAMMAL	TERRETOX MAMMALS
39	T-MONKEY	TERRETOX MONKEY
39	T-OIL	TERRETOX OIL
39	T-PUBELS	TERRETOX PUBLISHED ELSEWHERE
39	T-RODE	TERRETOX LABORATORY RODENT

xi. Enter *Notes (42)* information. This information may include information about duplicate data or tracking of the publication.

xii. To select *source of citation (44)*,

(1) Click on *Edit*, Click on *Insert Term*, Select source of citation code file from the *(N:\PROCITE\LISTS\SOURCE.LST)*, see Table 3.

(2) Select the appropriate database and in the case of LITBIB's add the LITBIB citation after the LITBIB number.

(3) Double click on *Insert Term* and *Close*.

Table 3. Source codes and descriptions.

SOURCE CODES	SOURCE CODE DESCRIPTIONS
L#	LITBIB #
AGRIS	AGRIS International
Agricola	Agricola

SOURCE CODES	SOURCE CODE DESCRIPTIONS
ASFA	ASFA
BIOSIS	BIOSIS
CAB	CAB
CAS	CA Search
CC	Current Contents
Life Sciences	Life Sciences
MEDLINE	MEDLINE
P #	PHYTOTOX #
Pascal	Pascal
POLTOX	POLTOX
RETOX #	RETOX #
T #	TERREF #
TOXLINE	TOXLINE
TOXNET	TOXNET
WEB Search	WEB Search

xiii. To select *keyword (45)*,

(1) Click on *Edit*, Click on *Insert Term*, Select keyword codes from the appropriate keyword list files including *(N:\PROCITE\LISTS\ARCHIVE.LST* archive lists, and N*:\PROCITE\LISTS\NONAPDSC.LSt* for Non-Applicable lists), see Table 4 and 5.
(2) Select the appropriate keyword.
(3) Double click on *Insert Term* and *Close*.

Table 4. Archive codes and descriptions

ARCHIVE CODES	DESCRIPTION
ATTACHED	If an abstract or other second source is attached to the paper it refers to, assign "Archive" status to the citation of the abstract or second source with the keyword "Attached". Include in the note field the Reference number of the main publication.
INCORRECT CITATION	For citations being retained in IP after being found not to be correct, assign "Archive" status with the keyword "Incorrect Citation". Place paperwork documenting correct citation and/or attempts to verify into the Archive file.

ARCHIVE CODES	DESCRIPTION
NOT PURSUING	For a citation which is being terminated as unavailable or not worth additional effort or expense to locate, assign the keyword "Not Pursuing". Additional information may be included in the note field, such as "No source located", or "Likely survey". Guidelines for decisions of when to suspend efforts to locate a publication are as follows: (a) If a publication of any type has a marginal possibility of being applicable, do not pursue beyond author request and ILL, (b) Publications identified as containing endpoint data are given higher priority, (c) Peer-reviewed journals are the preferred source; other reports of the same study should not be pursued if journal articles are available, (d) older publications (pre-1980) are given lower priority for commercial order, (e) documents listed in the CAD bibliographies and items ordered as replacements for missing publications already reviewed are given priority and are not terminated without trying all possible resources.
PUBLISHED ELSEWHERE	If a citation is found which clearly duplicates material already held and not a preferred source (e.g., a peer-reviewed journal article would be ordered even if a technical report covering the same material was already held), assign "Archive" status with the keyword "Published Elsewhere". Include the Reference File number of the other item(s) in the note field in IP.

xiv. Papers related to the EcoSSL effort:

(1) If papers meet the accepted criteria an OK is placed in the In Process file under EcoSSL Status (line #30)
(2) The date that the publication is forwarded to an EcoSSL team member for evaluation is noted after the OK.
(3) If the publication does not meet the accepted criteria a NO is placed in the In Process file under EcoSSL Status with one of the InProcess abbreviations and a note (e.g., media: filter paper).
(4) Enter the TERRETOX three letter major effect grouping code in EcoSSL MJR Efct Group (line #31)

Table 5. InProcess Codes for Papers Processed for EcoSSL Acceptance Criteria

CRITERIA FOR ACCEPTABILITY	IP Abbreviation
Criteria 1	Source
Criteria 2	Toxicant
Criteria 3	Chemical
Criteria 4	Media
Criteria 5	Organic Matter
Criteria 6	pH
Criteria 7	Control

CRITERIA FOR ACCEPTABILITY	IP Abbreviation
Criteria 8	Duration
Criteria 9	Concentration
Criteria 10	Ecologically Relevant Endpoint
Criteria 11	Species

3. To Search Data:
   a. Select *View.*
   b. Select *Search.*
   c. Click the *'Fields'* button.
   d. Highlight the field to search (i.e. RECORD #) and click twice or click 'OK.'
   e. Type or select an operator ; use '=' for most searches, and type a record number or name for search and click the *'Search'* button, or press *Enter*.
   f. To Exit, click on *View,* click on *Quick Search*.

4. To Edit *InProcess* Data:
   a. Double-click on the appropriate reference.
   b. Use the mouse or tab key to get to the fields for editing.

5. To View Records:
   a. Click View.
   b. Click Formatted References.
   c. To Exit this:
      i. Click View.
      ii. Click Quick Search.

6. To Print Data:
   a. Select Records by highlighting and marking (x).
   b. Select Bibliography and Print Bibliography.
   c. Select Marked Records.
   d. Change Reference List title or Reference List Order, (optional)
   e. Click 'OK'.

ATTACHMENT B: Literature Search Strategy

The commercial computerized literature databases proposed for use include:

- AGRICOLA database (http://www.nal.usda.gov) provides a strong agricultural focus that has strict indexing codes for both toxicity and soil organisms.

- BIOSIS database (http://www.biosis.org/) provides a strict taxonomical indexing system. They recently (1993) began adding chemical registry numbers.

- CA Search database (http://www.cas.org/) provides a strict chemical indexing system, but lacks a taxonomical indexing system.

- PolTox/Toxline database, provided through SilverPlatter PolTox1 CD-ROM available at MED-Duluth. Ceased using PolTox in searches performed after 10/1/99. DIALOG databases (Pollution Abstracts, Toxline and NTIS) are used for searches performed after 10/1/99.

- Toxnet/Toxline database (http://igm.nlm.nih.gov/) provides a free web browser interface system, but has a limited search terms/strategy available. In the current version, the system is limited to nine terms. This search will be used to supplement the BIOSIS database search as needed. For example, only the BIOSIS subfile of TOXNET was searched to locate additional earthwork and collembola citations for the invertebrate search. The abbreviated search strategy is provided below.

- Current Contents: Agriculture, Biology & Environmental Sciences CD-ROM, using OVID, Version 3.0 software at MED-Duluth provides supplemental citations greater or equal to publication year 1998. The focus of this search is to locate citations for literature published after the databases listed above were updated and ECOSSL searches were performed.

AGRICOLA, BIOSIS, CA Search andToxline databases provide an index code for toxic effects data (see detailed search strategies below). The basic search will intersect four areas:

- soil species terms in the title, descriptor and abstract fields only
- priority chemicals terms in the title, descriptor and abstract fields only
- toxic effects indexing codes
- publication year $\geq$1988 or all publication years (see Chemical List for specific details on publication year searching)

Exclusion terms may also be used to further reduce the number of non-applicable citations located by a search strategy.

AGRICOLA Search

Species Terms (See Species List)

Chemical Names

alumin*, antimon*, arsen*, barium, barite, beryllium, cadmium, chromate, chromic, chromium, cobalt, copper, cupr*, iron or ferr*, lead, manganese, nickel*, seleno*, selenate, seleni*, silver, vanad*, zinc, dieldrin*, alvit, dieldrex, heod, illoxol, octalox, panoram, quintox, dimethanonaphthalene*, DDT, agritan, anofex, arkotine, azotox, bosan, bovidermol, chlorophenothan*, citox, clofenotane, dedelo, deoval, detox, detoxan, dibovan, dichlorodiphenyltrichloroethane, dicophane, didigam, didimac, diphenyltrichloroethane, dodat, dykol, estonate, genitox, gesafid, gesapon, gesarex, gesarol, guesapon, guesarol, byron, havero*, hildit, ivoran, ixodex, kopsol, mutoxin, neocide, parachlorocidum, pentachlorin, pentech, rukseam, santobane, ze*dane, DDD, dichlorodiphenyl(w)dichloroethane, dilene, rhothane, TDE, DDE, dichlorodiphenyl(w)dichloroethylene, pentachlorophen*, PCP, acutox, chem-penta, chem-tol, chlorophen, cryptogil, dowcide, crotox, fungifen, lauxtol, liroprem, nci, penchlorol, pentachlorofen*, pentacon, penta-kil, pentasol, penwar, peratox, permite, pervenol, priltox, santo*, weedone, witophen, RDX, hexolite, cyclonite, cyclotrimethylene*, trinitro(w)triazine, hexogen, pbx*, trimethylenetrinitramine, trinitrocyclotrimethylene, TNT, trinitrotoluene, tolit*, entosufon, tritol, triton, trotyl, trinitrotoluol, acenaphthene, acenaphth?lene, albocarbon, anthrac?n, anthrac?ne , benz*(w) (acephenanthrylene or anthracene or chrysene or fluoranthene, or fluorene or peryleneor phenanthrene or pyrene or pyrilene), benzacenaphthene, benzanthracene, benzanthrazen, benzanthrene, benzfluoranthene, benzindene, benzoanthracene, benzochrysene, benzofluoranthene, benzofluorene, benzoperylene, benzophenanthrene, benzopyrene, benzopyrilene, benzperylene, benzphenanthrene, benzpyrene, benzypyrene, beta-pyren*, binaphthylene, biphenylenemethane, biphenylmethane, bis-alkylamino(w)anthracene, camphor(n1)tar, chrysene, coal(w)tar(w)pitch, cyclopenta(w)naphthalene, dezodorator, dibenz(w)antracene, dibenz*(w)anthracene, dibenz*(w)fluorene, dibenzanthracene, dibenzoanthracene, dibenzofluorene, dibenzonaphthalene, dihydroacenaphthylene, diphenylenemethane, ethylenenaphthalene, fluoranthene, fluorene, green(w)oil, ,idryl, inden*(w)pyrene, indenopyrene, methylenebiphenyl, mighty(w)(150 or rd1), naphthal?n, naphthal?ne, naphthalenediylbenzene, naphthanthracene, naphthene, naphthalenebenzene, naphthylenebenzene, naphthyleneethylene, ortho-phenylenepyrene, paranaphthalene, peri-ethyl?nenaphthalene, phenanthr?n*, phenantrin, phenylenepyrene, pyrene, ravatite, tetra(w)olive, tetraphene, white(w)tar, (polynuclear or polycyclic(w) arom*(w)hydrocarbon*)

Category Codes

(W000 Pollution and (K100 Forestry Production-General or F110 Plant Production-Horticultural Crops or J100 Soil Biology or L600 Animal Physiology or F831 Plant Diseases-Fungal or F840 Plant Diseases-Physiological)) or (F600 Plant Physiology and Biochemistry and (uptake/de or phytotoxic?/de)) or F841 (Miscellaneous Plant Disorders)

BIOSIS Search

Species Codes

BC Bacteria or BC Microorganisms or BC Fungi
BC Plants
BC Invertebrates

Species Terms Use species terms from Species List

Category Codes

CC=22501 Toxicology-general; Methods And Experimental
CC=22506 Toxicology-Environmental And Industrial Toxicology

CC=51504 Plant Physiology, Biochemistry and Biophysics (Nutrition) and uptake*
CC=51520 Plant Physiology, Biochemistry and Biophysics (Metabolism) and uptake*

and

CC=37015 Public Health: Air, Water or Soil Pollution
CC=40000 Soil Microbiology
CC=52502 Agronomy-Miscellaneous and Mixed Crops
CC=52504 Agronomy-Grain Crops
CC=52506 Agronomy-Forage Crops and Fodder
CC=53008 Horticulture-Vegetables
CC=53010 Horticulture-Flowers and Ornamental
CC=53012 Horticulture-General, Miscellaneous and Mixed Crops
CC=53500 Forestry and Forest Products

Chemical name/CAS#

alumin*, antimon*, arsen*, barium, barite, beryllium, cadmium, chromium, chromate, chromic, cobalt, copper, cupr*, iron or ferr*, lead, manganese, nickel*, seleno*, selenate, seleni*, silver, vanad*, zinc, dieldrin*, alvit, dieldrex, heod, illoxol, octalox, panoram, quintox, dimethanonaphthalene*, DDT, agritan, anofex, arkotine, azotox, bosan, bovidermol, chlorophenothan*, citox, clofenotane, dedelo, deoval, detox, detoxan, dibovan, dichlorodiphenyltrichloroethane, dicophane, didigam, didimac, diphenyltrichloroethane, dodat, dykol, estonate, genitox, gesafid, gesapon, gesarex, gesarol, guesapon, guesarol, byron, havero*, hildit, ivoran, ixodex, kopsol, mutoxin, neocide, parachlorocidum, pentachlorin, pentech, rukseam, santobane, ze*dane, DDD, dichlorodiphenyl(w)dichloroethane, dilene, rhothane, TDE, DDE, dichlorodiphenyl(w)dichloroethylene, pentachlorophen*, PCP, acutox, chem-penta, chem-tol, chlorophen, cryptogil, dowcide, crotox, fungifen, lauxtol, liroprem, nci, penchlorol, pentachlorofen*, pentacon, penta-kil, pentasol, penwar, peratox, permite, pervenol, priltox, santo*, weedone, witophen, RDX, hexolite, cyclonite, cyclotrimethylene*, trinitro(w)triazine, hexogen, pbx*, trimethylenetrinitramine, trinitrocyclotrimethylene TNT, trinitrotoluene, tolit*, entosufon, tritol, triton, trotyl, trinitrotoluol, acenaphthene, acenaphth?lene, albocarbon, anthrac?n, anthrac?ne , benz*(w) (acephenanthrylene or anthracene or chrysene or fluoranthene, or fluorene or peryleneor phenanthrene or pyrene or pyrilene), benzacenaphthene, benzanthracene, benzanthrazen, benzanthrene, benzfluoranthene, benzindene, benzoanthracene, benzochrysene, benzofluoranthene, benzofluorene, benzoperylene, benzophenanthrene, benzopyrene, benzopyrilene, benzperylene, benzphenanthrene, benzpyrene, benzypyrene, beta-pyren*, binaphthylene, biphenylenemethane, biphenylmethane, bis-alkylamino(w)anthracene, camphor(n1)tar, chrysene, coal(w)tar(w)pitch, cyclopenta(w)naphthalene, dezodorator, dibenz(w)antracene, dibenz*(w)anthracene, dibenz*(w)fluorene, dibenzanthracene, dibenzoanthracene, dibenzofluorene, dibenzonaphthalene, dihydroacenaphthylene, diphenylenemethane, ethylenenaphthalene, fluoranthene, fluorene, green(w)oil, , idryl, inden*(w)pyrene, indenopyrene, methylenebiphenyl, mighty(w)(150 or rd1), naphthal?n, naphthal?ne, naphthalenediylbenzene, naphthanthracene, naphthene, naphthalenebenzene, naphthylenebenzene, naphthyleneethylene, ortho-phenylenepyrene, paranaphthalene, peri-ethyl?nenaphthalene, phenanthr?n*, phenantrin, phenylenepyrene, pyrene, ravatite, tetra(w)olive, tetraphene, white(w)tar, (polynuclear or polycyclic(w) arom*(w)hydrocarbon*)

and

All CAS numbers from chemical list will be used.

CA Search Terms

Species Terms

Use species terms from Species List

Category Codes

SC=CA?04* (Toxicology) or ((SC=CA?05* (Agrochemicals) or SC=CA?19* Fertilizers, Soils and Plant Nutrition) and effect*(w)on) or ((CA?11* Plant Biochemistry) and uptake*) and soil*

CAS#

Use CAS# only from chemical list

PolTox/Toxline Search Search using Toxline, Pollution Abstracts, NTIS to be developed. [12/14/99]

Species terms

Use species terms from Species List

Chemical names

alumin*, antimon*, arsen*, barium, barite, beryllium, cadmium, chromate, chromic, chromium, cobalt, copper, cupr*, iron or ferr*, lead, manganese, nickel*, seleno*, selenate, seleni*, silver, vanad*, zinc, dieldrin*, alvit, dieldrex, heod, illoxol, octalox, panoram, quintox, dimethanonaphthalene*, DDT, agritan, anofex, arkotine, azotox, bosan, bovidermol, chlorophenothan*, citox, clofenotane, dedelo, deoval, detox, detoxan, dibovan, dichlorodiphenyltrichloroethane, dicophane, didigam, didimac, diphenyltrichloroethane, dodat, dykol, estonate, genitox, gesafid, gesapon, gesarex, gesarol, guesapon, guesarol, byron, havero*, hildit, ivoran, ixodex, kopsol, mutoxin, neocide, parachlorocidum, pentachlorin, pentech, rukseam, santobane, ze*dane, DDD, dichlorodiphenyl(w)dichloroethane, dilene, rhothane, TDE, DDE, dichlorodiphenyl(w)dichloroethylene, pentachlorophen*, PCP, acutox, chem-penta, chem-tol, chlorophen, cryptogil, dowcide, crotox, fungifen, lauxtol, liroprem, nci, penchlorol, pentachlorofen*, pentacon, penta-kil, pentasol, penwar, peratox, permite, pervenol, priltox, santo*, weedone, witophen, RDX, hexolite, cyclonite, cyclotrimethylene*, trinitro(w)triazine, hexogen, pbx*, trimethylenetrinitramine, trinitrocyclotrimethylene, TNT, trinitrotoluene, tolit*, entosufon, tritol, triton, trotyl, trinitrotoluol, acenaphthene, acenaphth?lene, albocarbon, anthrac?n, anthrac?ne , benz*(w) (acephenanthrylene or anthracene or chrysene or fluoranthene, or fluorene or peryleneor phenanthrene or pyrene or pyrilene), benzacenaphthene, benzanthracene, benzanthrazen, benzanthrene, benzfluoranthene, benzindene, benzoanthracene, benzochrysene, benzofluoranthene, benzofluorene, benzoperylene, benzophenanthrene, benzopyrene, benzopyrilene, benzperylene, benzphenanthrene, benzpyrene, benzypyrene, beta-pyren*, binaphthylene, biphenylenemethane, biphenylmethane, bis-alkylamino(w)anthracene, camphor(n1)tar, chrysene, coal(w)tar(w)pitch, cyclopenta(w)naphthalene, dezodorator, dibenz(w)antracene, dibenz*(w)anthracene, dibenz*(w)fluorene, dibenzanthracene, dibenzoanthracene, dibenzofluorene, dibenzonaphthalene, dihydroacenaphthylene, diphenylenemethane, ethylenenaphthalene, fluoranthene, fluorene, green(w)oil , idryl, inden*(w)pyrene, indenopyrene, methylenebiphenyl, mighty(w)(150 or rd1), naphthal?n, naphthal?ne, naphthalenediylbenzene, naphthanthracene, naphthene, naphthalenebenzene, naphthylenebenzene, naphthyleneethylene, ortho-phenylenepyrene, paranaphthalene, peri-ethyl?nenaphthalene, phenanthr?n*, phenantrin, phenylenepyrene, pyrene, ravatite, tetra(w)olive, tetraphene, white(w)tar, (polynuclear or polycyclic(w) arom*(w)hydrocarbon*)

Descriptor Code: soil*

Inclusion Database: Toxline (DB=TOX)
Exclusion Database: Riskline (only online data and lacks a bibliography (similar to RTECS)).

TOXNET/BIOSIS SEARCH

Species: earthworm or collembola

Chemicals: cadmium, cobalt, barium, aluminum, antimony, arsenic, beryllium, chromium, copper, iron, lead, manganese, nickel, selenium, silver, vanadium, zinc, dieldrin, ddt, dde, ddd, pentachlorophenol, pcp, trinitrotoluene, tnt, rdx

Database: Toxline: Subfile = Toxicological Aspects of Environmental Health (BIOSIS)

Publication Year: 1981 to present (Note: only selections available are 1965 or 1981 to present)

CURRENT CONTENTS SEARCH: Standard Search

Species terms

Use species terms from Species List

Chemical names

alumin*, antimon*, arsen*, barium, barite, beryllium, cadmium, chromate, chromic, chromium, cobalt, copper, cupr*, iron or ferr*, lead, manganese, nickel*, seleno*, selenate, seleni*, silver, vanad*, zinc, dieldrin*, alvit, dieldrex, heod, illoxol, octalox, panoram, quintox, dimethanonaphthalene*, DDT, agritan, anofex, arkotine, azotox, bosan, bovidermol, chlorophenothan*, citox, clofenotane, dedelo, deoval, detox, detoxan, dibovan, dichlorodiphenyltrichloroethane, dicophane, didigam, didimac, diphenyltrichloroethane, dodat, dykol, estonate, genitox, gesafid, gesapon, gesarex, gesarol, guesapon, guesarol, byron, havero*, hildit, ivoran, ixodex, kopsol, mutoxin, neocide, parachlorocidum, pentachlorin, pentech, rukseam, santobane, ze*dane, DDD, dichlorodiphenyl(w)dichloroethane, dilene, rhothane, TDE, DDE, dichlorodiphenyl(w)dichloroethylene, pentachlorophen*, PCP, acutox, chem-penta, chem-tol, chlorophen, cryptogil, dowcide, crotox, fungifen, lauxtol, liroprem, nci, penchlorol, pentachlorofen*, pentacon, penta-kil, pentasol, penwar, peratox, permite, pervenol, priltox, santo*, weedone, witophen, RDX, hexolite, cyclonite, cyclotrimethylene*, trinitro(w)triazine, hexogen, pbx*, trimethylenetrinitramine, trinitrocyclotrimethylene, TNT, trinitrotoluene, tolit*, entosufon, tritol, triton, trotyl, trinitrotoluol, acenaphthene, acenaphth?lene, albocarbon, anthrac?n, anthrac?ne , benz*(w) (acephenanthrylene or anthracene or chrysene or fluoranthene, or fluorene or peryleneor phenanthrene or pyrene or pyrilene), benzacenaphthene, benzanthracene, benzanthrazen, benzanthrene, benzfluoranthene, benzindene, benzoanthracene, benzochrysene, benzofluoranthene, benzofluorene, benzoperylene, benzophenanthrene, benzopyrene, benzopyrilene, benzperylene, benzphenanthrene, benzpyrene, benzypyrene, beta-pyren*, binaphthylene, biphenylenemethane, biphenylmethane, bis-alkylamino(w)anthracene, camphor(n1)tar, chrysene, coal(w)tar(w)pitch, cyclopenta(w)naphthalene, dezodorator, dibenz(w)antracene, dibenz*(w)anthracene, dibenz*(w)fluorene, dibenzanthracene, dibenzoanthracene, dibenzofluorene, dibenzonaphthalene, dihydroacenaphthylene, diphenylenemethane, ethylenenaphthalene, fluoranthene, fluorene, green(w)oil, idryl, inden*(w)pyrene, indenopyrene, methylenebiphenyl, mighty(w)(150 or rd1), naphthal?n, naphthal?ne, naphthalenediylbenzene, naphthanthracene, naphthene, naphthalenebenzene, naphthylenebenzene, naphthyleneethylene, ortho-phenylenepyrene, paranaphthalene, peri-ethyl?nenaphthalene, phenanthr?n*, phenantrin, phenylenepyrene, pyrene, ravatite, tetra(w)olive, tetraphene, white(w)tar, (polynuclear or polycyclic(w) arom*(w)hydrocarbon*)

Descriptor Code: soil*

Publication Year: 1998 to present. The search will be performed quarterly in conjunction with the MED hand search using the CDROM update date, since the last search was performed. No plant exclusion terms are used in this search.

Current Contents: Journal Issue Search

Journal issues will be screened within the software and applicable citations will be downloaded into ProCite for acquisition. This search strategy will focus on developing the literature search terms that may be missed in the standard search term list.

Publication Year: 1998 to present. The search will be performed quarterly in conjunction withe MED hand search using the CDROM update date, since the last search was performed.

Journals:

Acta Agriculturae Scandinavica Section B - Soil and Plant Science
Agriculture Ecosystems & Environment
Ambio
Applied and Environmental Microbiology
Applied Soil Ecology
Australian Journal of Agricultural Research
Biodegradation
Biology and Fertility of Soils
Bioresource Technology
Bioscience Biotechnology and Biochemistry
Communications in Soil Science and Plant Analysis
FEMS Microbiology Ecology
Geoderma
Journal of Industrial Microbiology Biotechnology
Journal of Plant Nutrition
Journal of Soil Contamination
Mycological Research
Mycopathologia
Mycorrhiza
New Phytologist
Pedobiologia
Plant and Soil
Plant Physiology
Science of the Total Environment
Soil & Tillage Research
Soil Biology & Biochemistry
Soil Science
Soil Science and Plant Nutrition
Soil Science Society of America Journal
Zeitschrift fuer Pflanzenernaehrung und Bodenkunde

SPECIES LIST

Invertebrates	**Plants**
annelid*	bean* or phaseolus
caenorhabditis	bluegrass or poa
collembol*	bluestem
dendrobaena	carrot* or daucus
earthworm*	brassica
eisenia	clover
insect(3n)larva*	corn or maize
lumbricus or lumbricid*	cotton
metal* and invertebrat*	crop(w)yield*
mite*	cucumber* or cucumis
potworm*	fescue
scud*	foliage
springtail*	leaf
soil*(3n)arthropod* or microarthropod* or macroarthropod*	leaves
	legum*
soil*(3n)biota or microbiota or macrobiota	lettuce* or lactuca
soil*(3n)animal*	oak* or quercus
soil*(3n)fauna or microfauna or macrofauna	oat or oats or avena
	pea or peas
soil*(3n)invertebrat* or microinvertebrat* or macroinvertebrat*	phytotoxic*
	pine* or pinus
soil*(3n)nematod*	plant*(3n)grow*
worm*	plant*(w)yield
	radish* or raphanus
	rice
	root*
	ryegrass*
	seed*(3n)germinat*
	seedling*
	soil*(3n)emergence
	soil*(3n)germinat*
	soybean*
	spinach*
	stem*
	tree*
	vascular (w)plant*
	wheat
	Exclusion Terms:
	acid*(w)rain
	mining(w)waste*[1]
	sewage(w)sludge*
	smelter*
	trace(w)element*
	wastewater* or waste(w)water*

** All species terms are intersected with all effect/process terms.

NOTE: 3n= the second term is within three terms either before or after the first term;
w = the second term is adjacent to the first word

[1] Based on the SAB review (April 1999) the term "mining(w)waste" will be removed from the list of Exclusion Terms for the next time a search is conducted.

CHEMICAL LIST

ALUMINUM (alumin*)
Publication Year: Invert = All years/ Plants ≥1988
7429905 Aluminum
7446700 Aluminum chloride
7784181 Aluminum fluoride
7784250 Sulfuric acid, Aluminum ammonium salt (2:1:1)
10043013 Sulfuric acid, Aluminum salt (3:2)
10043671 Sulfuric acid, Aluminum potassium salt
13473900 Aluminum nitrate (Al(NO3)3)
10043671 Aluminum potassium sulfate (AlK(SO4)2)
10043013 Aluminum sulfate
17927650 Aluminum sulfate hydrate
7784272 Aluminum nitrate nonahydrate
7784136 Aluminum chloride hexahydrate
15098870 Aluminum fluoride trihydrate
10124273 Aluminum chloride hydrate
7784318 Aluminum sulfate octahydrate
32287653 Aluminum fluoride dihydrate
16828118 Aluminum sulfate hydrate

ANTIMONY (antimon*)
Publication year = All years
7440360 Antimony III
1333784 Potassium antimonate
28300745 Antimony potassium tartrate
10025919 Antimony trichloride
7783564 Antimony trifluoride
1345046 Antimony trisulfide
11071151 L-Antimony potassium tartrate
12208138 Potassium hexahydroantimonate
33908666 Sodium hexahydroxy antimonate
63994332 Hexahydroxyantimonate (1-) potassium

ARSENIC (arsen*)
Publication Year: Invert = All years/ Plants ≥1988
7440382 Arsenic
7631892 Arsenic acid, Sodium salt
7645252 Arsenic acid, Lead salt
7778394 Arsenic acid (H3AsO4)
7778430 Arsenic acid, Disodium salt
7784341 Arsenous trichloride
7784409 Arsenic acid, Lead(2+) salt (1:1)
7784443 Arsenic acid, Diammonium salt
7784465 Arsenenous acid, Sodium salt
10048950 Arsenic acid, Disodium salt, Heptahydrate (Na2AsH3o4.7H2O
15120179 Sodium arsenate (NaAsO3)
13464385 Sodium arsenate (Na3AsO4)
7631892 Sodium arsenate (generic form)
13466063 Sodium arsenite (Na2HAsO3)
13464374 Sodium arsenite (Na3AsO3)

BARIUM (barium or barite)
Publication year = All years
513779 Barium carbonate
543806 Barium acetate
115216778 Barium nitrate hydrate
10326279 Barium chloride hydrate
7440393 Barium
7727437 Barium sulfate
10022318 Barium nitrate
10361372 Barium chloride
13462867 Barite (barium sulfate)
21109955 Barium sulfide

BERYLLIUM (beryllium)
Publication year = All years
7440417 Beryllium
7787475 Beryllium chloride
7787497 Beryllium fluoride
13327327 Beryllium hydroxide
7787555 Beryllium nitrate (Be(NO3)2.3H20)
13597994 Beryllium nitrate (BeN2O6)
12161829 Beryllium silicate
13510491 Beryllium sulfate
7787566 Beryllium sulfate tetrahydrate

CADMIUM (cadmium)
Publication year = ≥1988
7440439 Cadmium
543908 Cadmium acetate
7789426 Cadmium bromide
10108642 Cadmium chloride
7790809 Cadmium iodide (CdCI2)
10022681 Nitric acid, Cadmium salt tetrahydrate
10325947 Cadmium nitrate
10124364 Cadmium sulfate
7790785 Cadmium chloride hydrate
7790843 Cadmium sulfate 8/3H2O
89759808 Cadmium acetate hydrate
34330648 Cadmium chloride hydrate

CHROMIUM (chromium, chromate, chromic)
Publication Year: Invert = All years/ Plants ≥1988
1066304 Acetic acid, Chromium(3+) salt
7440473 Chromium
7738945 Chromic acid (+6)
7775113 Sodium chromate (+6)
7778509 Chromic acid, Dipotassium salt (+6)
7788978 Chromium fluoride (+3)
7788989 Chromic acid, Diammonium salt (+6)
7789006 Chromic acid, Dipotassium salt (+6)
10025737 Chromium chloride (+3)
10101538 Sulfuric acid, Chromium (3+) salt (3:2)
10141001 Chromium potassium sulfate (+3)
10588019 Sodium dichromate (+6)
12680487 Sodium chromate (unknown formula)
13530682 Chromic acid (+6)
13548384 Chromium(III) nitrate (+3)
13907454 Chromate (CrO4) (+6)

13907476 Chromate (+6)
15244389 Chromium sulfate pentahydrate (+3)
18540299 Hexavalent chromium
7789028 Chromium nitrate nonahydrate

COBALT (cobalt)
Publication Year: Invert = All years/ Plants ≥1988
7440484 Cobalt
71487 Cobalt acetate
7646799 Cobalt chloride
10141056 Cobalt nitrate
10124433 Cobalt sulfate
544183 Cobalt(2)formate
60459087 Cobalt sulfate hydrate
69098142 Cobalt chloride hydrate

COPPER (copper, cupr*)
Publication year = ≥1988
7440508 Copper
1344678 Copper chloride
1333228 Copper sulfate
7758987 Copper sulfate
598549 Copper acetate
1332656 Copper chloride hydroxide
4180125 Copper acetate
6046931 Acetic acid, Copper 2+ salt monohydrate
7758998 Sulfuric acid copper (2+) salt (1:1), Pentahydrate
142712 Cupric acetate
3251238 Cupric nitrate
3251294 Cuprous nitrate
7447394 Cupric chloride
7758896 Cuprous chloride
13770188 Cupric perchlorate
66923668 Copper acetate hydrate
13468854 Cupric chloride hydrate
19004194 Cupric nitrate hydrate
10125130 Copper chloride dihydrate

IRON (iron, ferr*)
Publication Year: Invert = All years/ Plants ≥1988
563713 Carbonic acid, Iron(2+)salt (1:1)
7439896 Iron
7705080 Iron chloride
7758943 Iron chloride FeCl2
10124499 Iron sulfates
10421484 Nitric acid, Iron(3+) salt
11113669 Iron hydroxide
12040572 Iron chloride
26273461 Carbonic acid, Iron (3+) salt
1309337 Ferric hydroxide
1317379 Ferrous sulfide
7720787 Ferrous sulfate
10028225 Ferric sulfate
18624447 Ferrous hydroxide
10028225 Ferric sulfate hydrate
7705080 Iron trichloride hexahydrate
13478109 Iron dichloride tetrahydrate

LEAD (lead)
Publication year = ≥1988
7439921 Lead
301042 Lead acetate
7758954 Lead chloride
10099748 Lead nitrate
7446142 Lead sulfate
546678 Acetic acid, Lead (4+) salt
13826658 Nitrous acid, Lead (2+) salt

MANGANESE (manganese)
Publication Year: Invert = All years/ Plants ≥1988
7439965 Manganese
13444729 Manganese (III) sulfate
11132788 Manganese chloride
7773015 Manganese chloride (MnCl2)
10377669 Manganese nitrate
15710664 Manganese nitrate hydrate
15244367 Manganese sulfate hydrate

NICKEL (nickel*)
Publication Year: Invert = All years/ Plants ≥1988
373024 Acetic acid, Nickel (2+) salt
7791200 Nickel chloride hexahydrate
69098153 Nickel chloride hydrate
15060625 Nickel (II) selenate
7440020 Nickel
7718549 Nickelous chloride
13138459 Nickelous nitrate
7786814 Sulfuric acid, nickel(2+)salt (1:1)
10101970 Nickel sulfate hexahydrate
373024 Nickelous acetate tetrahydrate
13478007 Nickel (II) chloride hydrate

SELENIUM (seleno*, seleni*, selenate)
Publication Year: Invert = All years/ Plants ≥1988
7446084 Selenium dioxide
7790592 Potassium selenate
10431147 Potassium selenite
7783075 Hydrogen selenide
7782492 Selenium
7783008 Selenous acid
13410010 Sodium selenate
10102188 Sodium selinite

SILVER (silver)
Publication Year: Invert = All years/ Plants ≥1988
506649 Silver cyanide
563633 Acetic acid, Silver (1+) salt
7440224 Silver
7761888 Silver nitrate
7783906 Silver chloride
7783962 Silver iodide
10294265 Silver sulfate

VANADIUM (vanad*)
Publication year = All years
7440622 Vanadium

7718981 Vanadium chloride
7727186 Vanadyl chloride
7803556 Vanadic acid, Ammonium salt
13718268 Sodium vanadate
13721396 Vanadic acid, Trisodium salt
14333187 o-Vanadate

ZINC (zinc)
Publication year = ≥1988
7440666 Zinc
7646857 Zinc chloride
7779886 Zinc nitrate
7733020 Zinc sulfate
557346 Zinc acetate
1314223 Zinc peroxide
1314847 Zinc phosphide
7446200 Zinc sulfate heptahydrate
7699458 Zinc bromide
10139476 Zinc iodide
13597449 Sulfurous acid, Zinc salt (1:1)
10196186 Zinc nitrate hydrate
5970456 Zinc acetate dihydrate

DIELDRIN
Publication Year: Invert ≥1988 / Plant = All years
60571 dieldrin*, alvit, dieldrex, heod, illoxol, octalox, panoram, quintox, dimethanonaphthalene*

DDT Group
Publication Year: Invert ≥1988 / Plant = All years
50293 DDT, agritan, anofex, arkotine, azotox, bosan, bovidermol, chlorophenothan*, citox, clofenotane, dedelo, deoval, detox, detoxan, dibovan, dichlorodiphenyltrichloroethane, dicophane, didigam, didimac, diphenyltrichloroethane, dodat, dykol, estonate, genitox, gesafid, gesapon, gesarex, gesarol, guesapon, guesarol, byron, havero*, hildit, ivoran, ixodex, kopsol, mutoxin, neocide, parachlorocidum, pentachlorin, pentech, rukseam, santobane, ze*dane
72548 DDD, dichlorodiphenyl(w)dichloroethane, dilene, rhothane, TDE
72559 DDE, dichlorodiphenyl(w)dichloroethylene

PENTACHLOROPHENOL
Publication Year: Invert ≥1988 / Plant = All years
87865 Pentachlorophen*, PCP, acutox, chem-penta, chem-tol, chlorophen, cryptogil, dowcide, crotox, fungifen, lauxtol, liroprem, nci, penchlorol, pentachlorofen*, pentacon, penta-kil, pentasol, penwar, peratox, permite, pervenol, priltox, santo*, weedone, witophen

RDX
Publication year = All years
121824 RDX, hexolite, cyclonite, cyclotrimethylene*, trinitro(w)triazine, hexogen, pbx*, trimethylenetrinitramine, trinitrocyclotrimethylene

TNT
Publication year = All years
118967 TNT, trinitrotoluene, tolit*, entosufon, tritol, triton, trotyl, trinitrotoluol

PAH Group
Publication year = All years

83329, 208968, 120127 56553, 50328, 205992, 191242, 207089, 218019, 53703, 206440, 86737, 193395, 91203, 85018 , 129000, 130498292
acenaphthene, acenaphth?lene, albocarbon, anthrac?n, anthrac?ne , benz*(w) (acephenanthrylene or anthracene or chrysene or fluoranthene, or fluorene or peryleneor phenanthrene or pyrene or pyrilene), benzacenaphthene, benzanthracene, benzanthrazen, benzanthrene, benzfluoranthene, benzindene, benzoanthracene, benzochrysene, benzofluoranthene, benzofluorene, benzoperylene, benzophenanthrene, benzopyrene, benzopyrilene, benzperylene, benzphenanthrene, benzpyrene, benzypyrene, beta-pyren*, binaphthylene, biphenylenemethane, biphenylmethane, bis-alkylamino(w)anthracene, camphor(n1)tar, chrysene, coal(w)tar(w)pitch, cyclopenta(w)naphthalene, dezodorator, dibenz(w)antracene, dibenz*(w)anthracene, dibenz*(w)fluorene, dibenzanthracene, dibenzoanthracene, dibenzofluorene, dibenzonaphthalene, dihydroacenaphthylene, diphenylenemethane, ethylenenaphthalene, fluoranthene, fluorene, green(w)oil, idryl, inden*(w)pyrene, indenopyrene, methylenebiphenyl, mighty(w)(150 or rd1), naphthal?n, naphthal?ne, naphthalenediylbenzene, naphthanthracene, naphthene, naphthalenebenzene, naphthylenebenzene, naphthyleneethylene, ortho-phenylenepyrene, paranaphthalene, peri-ethyl?nenaphthalene, phenanthr?n*, phenantrin, phenylenepyrene, pyrene, ravatite, tetra(w)olive, tetraphene, white(w)tar, (polynuclear or polycyclic(w) arom*(w)hydrocarbon*)

ATTACHMENT C: Chemical Verification Bibliography

Aldrich Chemical Company, Inc. 1994. Catalog Handbook of Fine Chemicals 1994-1995. Aldrich Chemical Company, Inc., Milwaukee, WI:2373 p.

Aldrich Chemical Company, Inc. 1993. Sigma-Aldrich Library of Rare Chemicals - Structure Index. Aldrich Chemical Co., Inc., Milwaukee, WI:1445 p.

Aldrich Chemical Company, Inc. 1992. Aldrich Structure Index. 1992-1993 Edition, Aldrich Chemical Co., Inc., Milwaukee, WI:548 p.

Aldrich Chemical Company, Inc. 1992. Catalog Handbook of Fine Chemicals 1992-1993. Aldrich Chemical Company, Inc., Milwaukee, WI:1992 p.

Aldrich Chemical Company, Inc. 1984. Aldrich Catalog Handbook of Fine Chemicals. Aldrich Chemical Company, Inc., Milwaukee, WI:1509 p.

American Chemical Society. 1965. Chemical Abstracts Services Registry Handbook. American Chemical Society, Columbus, OH

Ballschmiter,K. and M.Zell 1980. Analysis of Polychlorinated Biphenyls (PCB) by Glass Capillary Gas Chromatography. Fresenius Z. Anal. Chem. 302:20-31.

Buckingham,J. (Ed.) 1982. Dictionary of Organic Chemicals. Chapman and Hill, Fifth Edition, New York, NY:5769 p.

Budavari,S. (Ed.) 1989. Merck Index, 11th Edition. Merck & Co.,Inc., Rahway, NJ

Chapman & Hall 1993. CHCD Dictionary of Inorganic Compounds on CD-ROM. Chapman & Hall, London, UK.

Chapman & Hall 1993. CHCD Dictionary of Organic Compounds on CD-ROM. Chapman & Hall, London, UK.

Chemical and Pharmaceutical Press. 1992. MSDS Reference for Crop Protection Chemicals. John Wiley & Sons, INC., Fourth Edition, New York, NY:1414 p.

Chemical and Pharmaceutical Press. 1992. Crop Protection Chemicals Reference. John Wiley & Sons, INC., Eighth Edition, New York, NY:1892 p.

Chemical Information System 1992. Structure and Nomenclature Search System (SANSS), Version 7.02.

CRC Press, Inc. 1978. Handbook of Chemical Synonyms and Trade Names. Gardner,W., E.I. Cooke and R.W.I.Cooke (Eds.), Handbook of Chemical Synonyms and Trade Names, CRC Press, Inc., Boca Raton, FL

Dreisbach,R.R. (Ed.) 1959. Physical Properties of Compounds (II and III). American Chemical Society, Advances in Chemistry Series, Vol. 22 and Vol. 29, Washington, D.C.

Eastman Chemical Co. 1993. Laboratory Chemicals. Eastman Chemical Co., Rochester, NY:1195 p.

Fluka Chemical Corp. 1993. Fluka Chemical Catalog. Fluka Chemical Co., Ronkonkoma, NY:1512 p.

Hartley,D. and H.Kidd (Ed.) 1983. Agrochemicals Handbook. Royal Society of Chemistry, The University of Nottingham, Unwin Brothers Limited, Old Woking Surry, UK

Howard,P.H. and M.Neal. 1992. Dictionary of Chemical Names and Synonyms. In: P.H.Howard and M.Neals (Eds.), Dictionary of Chemical Names and Synonyms, Lewis Publishers, Chelsea, MI:(1992)

ICN Biomedicals, Inc. 1992. ICN Catalog. ICN Biomedicals Inc., Irvine, CA:1951 p.

Johnson Matthey Alpha Products. 1990. Alfa Catalog, Research Chemicals and Accessories. P.O. Box 8247, Ward Hill, MA: 1120 p.

Kamlet,M.J., R.M.Doherty, M.H.Abraham, P.W.Carr, R.F.Doherty, and R.W.Taft 1987. Linear Solvation Energy Relationships. 41. Important Differences Between Aqueous Solubility Relationships for Aliphatic and Aromatic Solutes. J. Phys. Chem. 91(7):1996-2004

Kuney,J.H. and J.M. Mullican (Eds.) 1991. Chemcyclopedia. American Chemical Society, Washington, DC 484 p.

Lewis,R.L. and D.V.Sweet (Eds.) Registry of Toxic Effects of Chemical Substances (1983-84 Suppl., Vol. 1 & 2). U.S. Dep. Health Human Serv., Center for Disease Control, Natl. Inst. for Occupational Safety and Health, Cincinnati, OH.

Rappoport,Z. (Ed.) 1967. Handbook of Tables for Organic Compound Identification. The Chemical Rubber Company, Third Edition, Cleveland, OH:564 p.

Sigma-Aldrich 1999. Sigma-Aldrich Brand Chemical Catalogs [on-line]. Available: https://www.sigma-aldrich.com/SAWS.nsf/Pages/Aldrich?EditDocument [1999, March 1].

Sigma Chemical Company. 1994. Biochemicals Organic Compounds for Research and Diagnostic Reagents. Sigma Chemical Company, St. Louis, MO:2352 p.

Sine,C. (Ed.) 1992. Farm Chemicals Handbook. Meister Publications Co., Willoughby, OH

STN International, Columbus, OH

TCI America 1991. Organic Chemicals, Laboratory Organics Fine and Specialty Organics Mfg., 91/92 Catalog. TCI America, Portland, OR:1405 p.

U.S. Environmental Protection Agency. 1986. Toxic Substances Control Act (TSCA) Chemical Substance Inventory. Volumes I-V. TSCA Inventory: 1985 Ed. U.S. EPA, Office of Toxic Substances, Washington, DC.

Verschueren,K. (Ed.) 1977. Handbook of Environmental Data on Organic Chemicals. Van Nostrand Reinholt Company, New York, NY:659 p.

Wauchope,R.D., T.M.Butler, A.G.Hornsby, P.W.M.Augustijn-Beckers, and J.P.Burt. 1992. The SCS/ARS/CES Pesticide Properties Database for Environmental Decision-Making. Rev. Environ. Contam. Toxicol. 123:164 p.

Weast,R.C. and M.J.Astle (Eds.) 1982. CRC Handbook of Chemistry and Physics. CRC Press, Inc., 63rd Edition, Boca Raton, FL

Weast,R.C., M.J.Melvin, and M.Jensen (Eds.) 1985. CRC Handbook of Data on Organic Compounds. CRC Press Inc., Boca Raton, FL (Vol. 1&2)

Weast,R.C. (Ed.) 1986. CRC Handbook of Chemistry and Physics. CRC Press, Inc., 67th Edition, Boca Raton, FL

Weed Science Society of America. 1970. Herbicide Handbook, Second Edition. In: W.F. Humphrey Press Inc., Eds., Geneva, NY:368 p.

Wiswesser,W.J. 1976. Pesticide Index, 5th Edition. Entomological Society of America, College Park, MD:328 p.

Worthing,C.R. 1991. The Pesticide Manual, 9th Edition. The British Crop Protection Council, Farnham, Surrey, UK:1141 p.

ATTACHMENT D: Instructions for DIALOG Online

Introduction

The DIALOGLINK software interacts with the DIALOG server. It holds the search strategy and the information you retrieve. In addition, it has an accounting tool to track the search costs. The instructions in this SOP are for using DIALOGLINK software, version 2.20. The software can be downloaded directly from the DIALOG web site (http://www.dialog.com/).

Configuring DIALOGLINK

After you load the software, under the Configuration menu and Service Setup, you must set up your communication method. For example, for an internet connection, the configuration should be set to Port = TCP/IP and Hostname = dialog.com. Enter your account number and password in the configuration and the software will automate your account and password login service each time you access DIALOG. Set your preferences for service to Maximum Buffer Size = MAX and to warn you when this is 80% full.

DIALOGLINK should operating with a Type-Ahead buffer. If a service is configured with a Type-Ahead buffer, the session window will have two independent scrolling regions. The top region is the Retrieve buffer for the online session, the bottom region is the Type-Ahead buffer, where commands can be typed or loaded before going online or while the host is still processing earlier commands.

Accessing DIALOGLINK

To get into **DIALOGLINK**, click on the DLINK icon. The icon should be created when you download and execute the DIALOGLINK software. Turn on modem or phone line, if necessary. There is a menu bar with DIALOGLINK features and a status bar on the top of the screen contains messages regarding buffer, accounting, on-line/off-line status.

Creating/Editing Search Terms

The search terms can be created and edited in either the DIALOGLINK Type-Ahead buffer or in WordPerfect. To edit the search terms in **WordPerfect**:

- Always save the text as DOS text with an extension, *.SRC for search terms.
- The WP commands may be saved for the DIALOG search in landscape format if the text wraps around in portrait format. The text must not **wrap** in DOS or **DIALOGLINK** will not read the search correctly.
- Use landscape (w/ 0.3,0.3 margins) in WP to be sure the text doesn't wrap.
- Save the file as an ASCI text format.

To use the type-ahead buffer

Enter search strategy on the search session screen. Click on "Save Copy as", then select **Type-Ahead Buffer** . Save the strategy as a new file, using a filename up to 8 characters long (the program automatically assigns the .SRC extension), and press **<enter>**. To load a .SRC file from a saved file to the type-ahead buffer, click "Load Type Ahead Buffer"**,** chance directory if necessary, to view the desired set of files. Default is usually c:\dlinkwin\searches.

After a file is loaded into the Type-Ahead buffer, the file may be edited using **DIALOGLINK** editing options. The search is not case sensitive. Spelling needs to be checked. Each search term line should start with an S (select). The command lines need to be checked for accuracy in logic using a practice database (see on-tap instructions below).

To connect to DIALOG Server

DIALOGLINK has been configured to automatically dial the phone number and present the user number and password. Remember to save all your search term edits prior to connecting or you will lose them. Click on "Connect" and the software will automatically connect you to the DIALOG server.

Remember that DIALOG will only search on search terms that are shown prior to the cursor (i.e., if your carriage return is placed above the line to be searched, DIALOG will wait until <enter> is pressed. This allows the user to edit terms while running a search).

Output

After the search is completed, the search and results (buffer) can be saved to the C:\dlinkwin\output drive (or a diskette), printed off-line by DIALOG or by E-mail. See DIALOG basics (below) for specific examples of output commands. If you retrieve the output to the buffer (using the Type command), use mark feature to download specific sections of either the search or results DIALOGLINK will save this on the c: drive with an extension of *.REF. If you want all results (buffer) to be saved or printed, you do not use the mark option. The print command will automatically delay the printing for 30 minutes to allow you to cancel the printing, if desired. After 30 minutes, the print command will begin and forward a hard copy output to you via surface mail. If you select to Email the output to an E-mail address, you have 30 minutes to cancel your output. Remember when E-mailing the output, the file must be under 3 mb (a warning will be displayed by DIALOG, it is greater than 3 mb). If is it greater than 3 mb, divide the search output into smaller sections thereby receiving several Email output files.

For compatibility with ProCite software, you must select FORMAT 4 (tagged field header output) as the output format. Select records to download from your search output using **FORMAT 4.** An output that consists of citations only, without search summary information, will provide a clean transfer. Additional information may be included in the files if necessary, see Section II.E.

If you are using the DIALOGLINK software, mark only citation information (not the search term text). Save your captured output by selecting "File", "Save copy as".

- Save the search output by naming the drive and filename.
- Double check (using WordPerfect) that the output file was saved properly before you exit DIALOGLINK.

DIALOG Search Basics

Refer to the full search documentation on the DIALOG web site (http://www.dialog.com) for basic DIALOGLINK instructions and additional DIALOG commands. A brief synopsis is presented below.

- To select a database to search, use Begin command (e.g. **B41** or **B44**)
- Terms are searched by using the Select command (e.g. **S wetland)**
- Use the displays sets command, **ds**, to display the terms searched so far
- To display records, you use the terms **type** or **print .** Example output commands are:

  Print S7/4/1-2
  where S7 = desired search output set number
  4 = format number
  1-2 = number of records to display (i.e., ALL, 1-10, etc.)

  Print S60/4/1-999/addr acdelore (Sends to email address selected for this account)

  Type S7/6/ALL (to type records on-line to Retrieve buffer)

  Print Cancel p0008 (to cancel off-line or Email print command)

- **LOGOFF** disconnects you from DIALOG

Connectors for search terms:

S S1 and S2 --> combines two sets of terms
S S1:s16 --> joins a numeric range of sets selected (e.g., s1 or s2 or s3, etc.)
S pesticide? --> "?" is the truncation symbol to retrieve variable word endings
E pesticide --> expand term locate all variable ending for the term
OR --> pesticide or wetland
AND --> pesticide and wetland
NOT --> pesticide not wetland
To select adjacent words in the selected order --> **pesticide(w)wetland** or **pesticide()wetland**

More adjacent word tips:

(2W) means up to two words separate the selected terms.
(3W) means up to 3 words separate the selected terms.
(F) means searching for two terms within a field like the title, abstract, or descriptors.
(N) means two words are adjacent, but in either order.

More advanced searching techniques:

Year search --> **S1 and PY = 1982:1993**
Search Update -- > UD = 9401:9999 will search records entered into the database between 1/94 and present (99/99).
Saving searches --> **Save temp** (e.g. "TB001" stored, remember the displayed number)
Recall searches --> **exs TB001**
Release TB001 will delete the saved search
Logoff hold --> will hold the search strategy for 30 minutes. DIALOG needs to be accessed again, but the search will begin where the user left off. (There is no on-line charge during this 30 minutes.)
Pause --> will hold the search strategy for 10 minutes. (However, there is an on-line charge for this time.)
From [datafile number]--> e.g., s 1 from 5, means only search the BIOSIS datafile. This is very useful for unique category codes and descriptors only found in one datafile. Also can be used to locate number of hits for individual databases in a Onesearch strategy.

Selecting Applicable Databases
DIALINDEX is a feature which allows the user to search a group of related databases simultaneously to determine which database(s) contain the most appropriate literature.
This features is used prior to selecting databases for searching. An example to finding the most appropriate data bases.

b 411 (DIALINDEX database) use ALLSCIENCE
S pesticide? and wetland?

You can rank the most applicable databases.

Practice Searching
OnTap is a subset of databases to help the user refine or correct a search prior to the performance of the final search, using a subset of the entire database and at a much cheaper or free rate. The account numbers and passwords are available on the DIALOG web site (http://www.dialog.com/) or contact the DIALOG HELP desk (800-334-2564). The passwords change every few months.

Searching Multiple Databases
DIALOG can perform two or more searches simultaneously, called a OneSearch (e.g., AFSA and Pollution Abstracts). You will be charged for both online costs during the search, but

combining searches can reduce total online time. OneSearch can be cross checked for duplicates using DIALOG commands, prior to printing. Remember to type in the databases selected from least to most cost. DIALOG will remove duplicates according to the order you selected the databases.

ATTACHMENT E: Instructions For Using SilverPlatter Software

Accessing WinSPIRS

SilverPlatter, Version 4, produces the WinSPIRS software used to access and search literature databases on CDROM. The WinSPIRS software can be accessed through any MED networked computer which has Windows 95. The computer used for a full search for one of the ECOTOX databases must have a large operating memory, since these searches are very complicated. Before running a new search, the search histories should be transferred to the C: drive from the floppy disk, and the search should be run from the C: drive. The icon for WinSPIRS in the MED LAN Scientific Applications window. More detailed instructions can be found in the WinSPIRS User Manual or on their web site (http://www.silverplatter.com/).

Selecting Databases:

To get into **WinSPIRS**, click on the SilverPlatter icon within the MED-LAN Scientific Applications window. The first screen displays the databases you may select. Click the databases you want to search over to the right-hand column. The system will display an error message if the databases are unavailable (in use by other MED staff). If the databases are available, a database copyright message will display. The database searched is Toxline, which is a subfile of PolToxI.

Creating/Editing Search Terms

The search terms can be created within WinSPIRS. The search files are saved, by clicking on the File menu, under Save Search History, with the ".his" extension. Large searches should be parsed into smaller groups of terms to save time in editing saved files. You cannot add or delete terms within search history file. You need to retype the entire portion within WinSPIRS and save the file again. However, you can edit typographical errors outside of the WinSPIRS software. Editing typographical errors can be performed using Microsoft WordPad and saved.

You do not need to type anything the search line other than the search terms. The software is not case sensitive. Logic and spelling need to be checked. Search terms are highlighted in the output. You can toggle between brief and full citations output.

Running a Saved Search

Enter search strategy on the search session screen. Click on "Load and Run Searches". Saved parsed searches can be run within WinSPIRS in any order. The search lines will be automatically renumbered.

Output

When the citation results are displayed, sort them by author name. The "Sort" option is in the Records menu. Make sure you select "Download Search History" in the download option menu. The "Print Search History" option must be selected, so the search terms can be proofed and evaluated by second person. For compatibility with ProCite software, you must select "Short Field Names" (tagged field header output) as the output format. See instructions for Bibliolinks

software below, if you want to transfer the citations to a ProCite file. Make any necessary changes and rerun any sections needed before proceeding with the final citation download. After the search is completed and formatted with the above modifications, the search and results can be saved to the C: drive (you cannot save to a disk or network drive from WinSPIRS).

Saving and Transferring Results for use with ProCite Bibliolinks Software:
In order to ensure compatibility with ProCite/Bibliolinks software, request records from the bibliographic databases in a tagged output format (output that uses field identifiers/ headers). An output that consists of citations only, without the search summary information, will provide a clean transfer. Additional information may be included in the files if necessary, see Section II.E.

Select records from your search output to download using a tagged format.

a. Select "File," "Download records".
b. Select the drive and directory to save the download file.
c. Save the download file in an ASCII format. Select "short field name headers" for your output.
d. Name the download file.
e. Select range of records to save to download file (eg., all marked records, 1-10).

WinSPIRS Search Basics
Refer to the full search documentation on the SilverPlatter web site, (http://www.silverplatter.com) for basic WinSPIRS instructions and additional Boolean commands. A brief synopsis is presented below.

Connectors for search terms:

#1 and #2 --> combines two sets of terms
#1 or #2 or #36 --> joins a numeric range of sets selected (e.g., s1 or s2 or s3, etc.)
pesticide* --> "*" is the truncation symbol to retrieve variable word endings
Use the "thesaurus" feature to locate all variable ending for the term
OR --> pesticide or wetland
AND --> pesticide and wetland
NOT --> pesticide not wetland
To select adjacent words in the selected order --> **aquatic toxicity**

More adjacent word tips:

(near2) means up to two words separate the selected terms.
(near3) means up to three words separate the selected terms.
(with) means searching for two terms within a field like the title, abstract, or descriptors.
(near) means two words are in the same sentence.

Other searching techniques:

The Limit feature creates search strategy for you by years and databases within PolTox. Use the strategy of limiting the terms to the abstract, descriptor and title fields. WinSpirs searches the affiliation field (i.e., the author address) which can include false hits, if not eliminated.

ATTACHMENT F: Instructions For Using Ovid Software (Current Contents)

Accessing Ovid

Ovid for Windows, Version 3.0, provides access to the CDROM Current Contents literature databases. The OVID software can only be accessed via the MED-Duluth library computer. Before running a new search, insert the appropriate Current Contents CD into the E: drive. The Current Contents disks are located in a carousel on top of the library PC tower. Detailed instructions can be found in the Ovid User Manual (in the MED-Duluth library) or on the web site http://www.ovid.com/.

Selecting Databases:

To access Ovid, click on the library PC "OVID" icon. The first screen displays the databases you may select from. Click on the database publication date that identifies the CDROM you have inserted into the computer's E: drive.

To change databases or publication year CDROMS, click on the "Database" button and insert the new disk. If you have previously entered a search strategy, you will have the option to save and reuse the same search strategy at this point. Select the new disk text within Ovid that matches the new CDROM disk.

Creating/Editing Search Terms

The initial search terms must be created within the Ovid software. The search files are saved, by clicking on the File menu under, "Save", then "Save Search Strategy" with the ".sav" (e.g., C:\ovid\users*.sav) file name extension. Large searches (n >) should be parsed into smaller groups of terms (eg., n =) to save time in editing saved files. You cannot add or delete search **lines** within search history file. You need to retype the entire portion within Ovid and save the file again. However, you can edit typographical errors and add/delete terms within the created search line outside of the OVID software. Editing typographical errors can be performed using Microsoft WordPad and saved.

When typing in a new search, you do not need to type anything at the beginning of the search line other than the search terms. The software is not case sensitive. Logic and spelling must be checked.

Running a Saved Search

From the File menu, click on "Open", then "Open Strategy". Select the search file name, then click on "Execute". Saved parsed searches can be run within OVID in any order. The search lines will be automatically renumbered.

Output

When the citation results are displayed, you can save search strategy results by selecting "Print" in the File menu. From the Print menu, select "Print Strategy" to print a copy of the search history with the number of citations found in the current search (Note: The search strategy

history cannot be electronically saved and truncates long search lines). Search terms can be proofed and evaluated by second person, using the search term file (*.sav).)

To print citations, select "Save" options in the File menu. Then click on "Save Documents". Type in the filename and drive you want the citation output to be stored. Click on the "Include Search Strategy" (but this has not saved the search strategy). The maximum citations that can be saved to one file is 500. Click on the "Options" button and modify the "Output Format" to "Reprint". For compatibility with ProCite software, you must select "Reprint" (tagged field header output) as the output format. See instructions for Bibliolinks software below, if you want to transfer the citations to a ProCite file. Make any necessary changes and rerun any sections needed before proceeding with the final citation download.

In order to ensure compatibility with ProCite/Bibliolinks software, request records from the bibliographic databases in a tagged output (output that uses field identifiers/ headers). An output that consists of citations only, without the search summary information, will provide a clean transfer. Additional information may be included in the files if necessary, see Section II.E.

Select records from your search output to download using a tagged format.

a. From File menu, Select , "Save Documents".
b. Select the drive to save the download file.
c. Select "Reprint" for your output format.
d. Name the download file.
e. Select range of records to save to download file (e.g., all records).

Ovid Search Basics

Refer to the full search documentation on the world-wide web (http://www.ovid.com/) for basic Ovid for Windows instructions and additional Boolean commands. A brief synopsis is presented below.

Connectors for search terms:

1 and 2 --> combines two sets of terms
1 or 2 or 3 --> joins a numeric range of sets selected (e.g., s1 or s2 or s3, etc.)
**pesticide$** --> "$" is the truncation symbol to retrieve variable word endings
OR --> pesticide or wetland
AND --> pesticide and wetland
NOT --> pesticide not wetland
To select adjacent words in the selected order --> **aquatic adj toxicity**

More adjacent word tips:

(adj2) means up to two words separate the selected terms.
(adj3) means up to three words separate the selected terms.

(with) means searching for two terms within a field like the title, abstract, or descriptors.
(adj) means two words are in the same sentence.

Other searching techniques:

Ovid automatically includes prefixes for truncated terms (e.g., water$ will locate freshwater and saltwater)

Journal searches can be done by clicking on the "Journal" button and typing in the journal name. This will move you to a journal index.

ATTACHMENT G: ECOTOX Rejection Categories

Categories considered unsuitable for the ECOTOX database effort.

Categories	Description
BIOLOGICAL PRODUCT	Biological toxicants, including venoms, fungal toxins, Bacillus thuringiensis, other plant, animal, or microbial extracts or toxins. Biological products being commercially produced and purified chemicals may be codable; may need to order paper to determine.
CHEMICAL METHODS	Chemical methods only--methods for determination of chemicals, purification of chemicals, etc.
DRUG	Testing for drug effects and side-effects. Drugs are coded when tested for environmental toxicity, including non-target organisms.
EFFLUENT	Effluent, sewage, polluted runoff. Studies involving caged organisms in field situations are coded if a concentration of any specific chemical component of the effluent is given. In identification, watch for comparison tests of single chemicals reported in the same publication.
CHEMICAL FATE/METABOLISM	Studies of what happens to the chemical, not what happens to the organism.
HUMAN HEALTH	Human health effects; studies with human subjects or with animal subjects as surrogates for human health risk assessment. Animal surrogates codable if testing environmental toxicants rather than medical applications.
IN VITRO	In Vitro studies, including exposure of cell cultures and excised tissues. In identification, watch for: In Vitro used for embryo and algae studies (codable); whole organisms exposed and an effect quantified using an In Vitro form (probably codable); and studies which also report results of whole-organism tests for comparison.
METHODS	Methods, no usable specific toxicity tests. Some papers presenting modifications of methods do report results of trial toxicity tests; order the paper if this seems likely. Some methods papers are also selected to be ordered for the ECOTOX Methods file.
MIXTURE	Publications that report data from aquatic laboratory and field studies for combinations of single toxicants are excluded; for example aquatic mixtures of copper and cadmium. Terrestrial publications reporting data for laboratory studies for mixtures are excluded while exposure in a field setting from contaminated natural soils or waste application to soil may be included.
MODELING	Modeling only, no new organism exposure data. Some publications may report toxicity tests performed as comparisons.
NO CONC	No usable dose or concentration reported--identified after examination of full paper. Includes lead-shot studies which lack dose information or give only number of pellets, etc., not a useable concentration.
NO DURATION	No duration--identified after examination of full paper. AQUIRE–acceptable to code NR for duration for abstract only or foreign-language papers; paper not coded entered as ND if an experimental method is reported. TERRETOX and PHYTOTOX–some studies without duration are coded if there is a quantifiable dose or concentration.
NO EFFECT	No effect reported for a biological test species.
NO SPECIES	No viable plant or organism present or tested.

Categories	Description
NO TOXICANT	No toxicant used. Publications often report responses to changes in water or soil chemistry variables, e.g., pH or temperature. Such publications are not included.
NO TOX DATA	Toxicant used but no toxicity effects reported. The publication may report genetic changes or effects on media chemistry; this type of endpoint is not included in the ECOTOX system.
NUTRIENT	Nutrient studies. Sometimes difficult to determine whether added chemicals are for the purpose of testing toxicity or benefit to the organism as a nutrient; order papers which are not clear from the abstract. Toxic effects of trace metals and specific chemical fertilizers (with CAS numbers available) are coded.
OIL	Oil and petroleum products. Not coded for AQUIRE or PHYTOTOX, a set-aside category for TERRETOX. In identification, watch for dispersants or other single chemicals reported in the same publication.
PUBL AS	The author states that the information in this report has been published in another source. The data is recorded from only one source; the second citation is noted as Publ As.
QSAR	Quantitative Structure-Activity Relationships; a form of modeling. Publications are rejected if raw toxicity data is not reported or if the toxicity data reported is a secondary form, ie., citing published data.
REVIEW	The data reported in the article not primary data from research conducted by the author; the publication is a compilation of data published elsewhere.
SEDIMENT CONC	The only exposure concentration reported is for the level of toxicant in the sediment.
SURVEY	Assessment of toxicity in the field over a period of time; often a duration nor an exposure concentration is not reported. Studies are primarily residue studies.

ATTACHMENT H: Creation of OCLC/ILL Order Form

To Open File(s) in ProCite:

a.. Press File and Open. (Screen will automatically display the last data screen used in ProCite.)
b. Select filename: C:\PROCITE3\MINITEX\MINITEX.DAT.

1. To Insert Data:
   a. Select Database and New Record to enter record (or press F9.)
   b. Select Minitex Workform with the arrow in the upper left corner of the 'New Record' table.
   c. Enter data and use the TAB key to jump to alternate fields.
   d Select Database and Save Record to save data (or press F10.)

2. To View Records:
   a Press View and Formatted Reference.
   b. Select the output style by pressing the arrow above the 'Minitex Info' window.
   c. Select filename: C:\PROCITE3\STYLES\MINITEX.OUT.
   d. Exit screen:
      i. Press View
      ii. Press Quick Search

3. To Search Records:
   a. Press View and Search.
   b. Select Field to search by pressing the 'Field' button.
   c. Highlight the field name to be searched and press okay. (i.e. RECORD #)
   d. After displaying the field name, type "=" and the data to be searched (i.e. RECORD "=100"), and press enter.
   e. Double-click on the highlighted record to view or edit record.

4. Use mouse to move curser to specified fields and press F10 to save changes.

5. To Sort Data by Title (Field #19):
   a. Select View and Sort by.
   b. Select 'Configure Available Sorts.'
   c. Select 'Define Custom Sort...'
   d. Select Sort by field option (i.e. Field #19) and press 'OK.'
   e. Select View, Sort by, and select Custom.

6. To Print Interlibrary Loan Journals Information List:
   a. Select Bibliography and Print Bibliography.
   b. Change the Reference List Title (i.e. Minitex List.)
   c. Select Reference List Order and change to 'Custom.'
   d. Select Destination: Word Processor File.
   e. Press 'OK.'
   f. Give a filename with the extension ".rtf" and press 'OK.'
   g. Go into WordPerfect 6.1 and then format in columns, etc.

EXAMPLE ILL/OCLC ORDER OUTPUT FROM InProcess DATABASE:

Rec #364 - Nekrasova, L. S. (1993)

Title: Effect of copper-smelting production on soil mesofauna.

Journal: EKOLOGIYA (MOSCOW) :83-85

Periodical

Title:_____

Order Source /Date :OL

Source of Citation: //BIOSIS 1/99//

OCLC # : 23278318

ISB(S)N: 0235-7224

EPA: _____

OTHER: AGL

MULS: _____

ATTACHMENT I: Summary of Searches

I. ECOSSL Search Results

Database/Date search performed	Total Hits	Hits after Duplicates Removed*	Applicable ECOSSL Hits (% Applicable Hits)	New Applic. ECOSSL Hits (% Applicable Hits)	Additional Applicable Citations Identified				Non-Applicable Citations**
					AQ	P	T	M/L	
TOTAL									

* The overlap between the databases search

x duplicate citations between Agricola and BIOSIS

x duplicate citations between BIOSIS and PolTox/Toxline

x duplicate citations between Agricola and PolTox/Toxline

** Non-applicable citation categories are:

No toxicant (n=x)

Biological toxicant (n=x)

Survey (no conc or duration) (n=x)

Human health (n=x)

Sediment/Effluent (AQUIRE rejects) (n=x)

Aquatic bacteria (n=x)

Modelling (n=x)

Mixture (laboratory study) (n=x)

No species (n=x)

Review, no toxicity data (n=)

II. ECOSSL Journal Listing

The Table 1 journal listing was compiled by ranking journal frequency from all computerized literature searches for plants and invertebrates. Journals with an 'x' in the column labeled 'other' were identified by EPA as potentially useful for identifying literature. The invertebrate journal rank was determined for any journal that listed ten or more citations. The plant journal rank was determined for any journal that listed twenty-five or more citations.

Table 1. ECOSSL Commonly Cited Journals (n=42)

Journal Name	Location*	Invert	Plant	Other
Acta Agriculturae Scandinavica Sect B - Soil and Plant Science	CC			x
Acta Zoologica Fennica	-	12		-
Agriculture Ecosystems & Environment	CC			x
Agrokhimiya	-		8	
Ambio	CC			x
Applied and Environmental Microbiology	CC			x
Applied Soil Ecology	CC	13		x
Archives of Environmental Contamination and Toxicology	MED	6		x
Australian Journal of Agricultural Research	CC		16	-
Biodegradation	CC			x
Biology and Fertility of Soils	CC	10		x
Bioresource Technology	CC			x
Bioscience Biotechnology and Biochemistry	CC			x
Bulletin of Environmental Contamination and Toxicology	MED	3	17	-
Chemosphere	MED	9	21	-
Communications in Soil Science and Plant Analysis	CC		3	x
Development of Plant and Soil Science (may only be a limited series)	-		4	
Ecotoxicology and Environmental Safety	MED	2		x
Environmental Toxicology and Chemistry	MED	1		x
Environmental Pollution	MED	7	10	x
FEMS Microbiology Ecology	CC			x
Geoderma	CC			x
Journal of Environmental Quality	MED		7	x
Journal of Industrial Microbiology Biotechnology	CC			x
Journal of Indian Society of Soil Science	-		6	-

Journal Name	Location*	Invert	Plant	Other
Journal of Plant Nutrition	CC		2	x
Journal of Soil Contamination	CC			x
Mycological Research	CC			x
Mycopathologia	CC			x
Mycorrhiza	CC			x
New Phytologist	CC		11	-
Pedobiologia	CC	4		x
Plant and Soil	CC		1	x
Plant Physiology	CC		9	-
Science of the Total Environment	CC	8	12	x
Soil & Tillage Research	CC			x
Soil Biology & Biochemistry	CC	5	18	x
Soil Science	CC		19	x
Soil Science and Plant Nutrition	CC		13	x
Soil Science Society of America Journal	CC		14	x
Water Air and Soil Pollution	MED	11	5	x
Zeitschrift fuer Pflanzenernaehrung und Bodenkunde	CC		15	x

* CC = Available in Current Contents (Agriculture, Biology & Environmental Science)

MED = Available MED Library (hand search)

"-" = not available in either source

III. ECOTOX Journal Search Tracking Form

Date of Search:									
Journal Title	Last Issue Previously Searched	Issues Searched in Current Search	Type of Search*	Number Applic. Citations**					
				A	P	T	APT	M R	Total
Aquat. Toxicol.									
Arch. Environ. Contam. Toxicol.									
Bull. Environ. Contam. Tox.									
Can. J. Fish. Aquat. Sci.									
Comp. Biochem. Physiol. C									
Chemosphere									
Ecotoxicol. Environ. Saf.									
Environ. Biol. Fish.									
Environ. Pollut.									
Freshwater Biol.									
J. Environ. Biol.									
J. Environ. Qual.									
J. Fish Biol.									
J. Freshwater Ecol.									
J. Gr. Lakes Res.									
J. N. Am. Benthol. Soc.									
Limnol. Oceanog.									
Water Air Soil Pollut.									
Water Res.									
Totals		# of issues:							
Environ. Toxicol. Chem. (Issues searched on arrival)									
Environ. Ecol. (Issues searched on arrival)									
Totals									
Overall Totals									

**Applicable citation types: ECO=Eco-SSL, A=AQUIRE, P=PHYTOTOX, T=TERRETOX, APT=Applicable to more than one ECOTOX database, MR=Methods and Reviews

ATTACHMENT J

LITERATURE ACCEPTANCE CRITERIA CHECKLIST

InProcess Reference Number _____

Study Type (Field/Laboratory) _____

Experimental design description (optional): If more than one experimental design is used in the study, multiple Literature Acceptance Criteria Checklist forms may be required. If more than one checklist is being used for this reference, briefly describe the characteristics of the study design (e.g., chemical, species, exposure location) that can be used to differentiate this checklist from the others.

No.	Criteria / *Detailed explanation of criteria*	Y/N/U*
1.	Is the document a primary source for the test result?	
	A document is considered a primary source only if at least one of the investigators who conducted the toxicity test is an author, and the authors do not cite another publication as the original source of the data.	
2.	Were the adverse effects caused by a single stressor?	
	The focus of the Eco-SSL effort is to present results from toxicity tests involving a single stressor. Tests concerning synergism, additivity, potentiation, or antagonism, whether it involves two or more chemical stressors or a combination of chemical and non-chemical stressors are not acceptable studies under this criteria. Effluents, leachates, drilling muds, fly ashes, sediments, and sludges are not considered single chemicals. In addition, the single chemical cannot be introduced as a component of an effluent, etc. Emulsifiable concentrates and wettable powders are considered single chemicals because they can provide very high quality results in some cases, which will be determined using the Task Group 4 Evaluation criteria (TG4-SOP#3). Chemicals such as toxaphene are considered single chemicals because they are mixtures of structurally similar organic chemicals that only exist in large quantities as commercial mixtures of the various chemicals and apparently have similar biological, chemical, physical, and toxicological properties.	

* Y = yes; N = no; U = unknown

No.	Criteria / *Detailed explanation of criteria*	Y/N/U*
3.	Was the chemical form (i.e., metal salt vs. metal) and concentration reported by the author(s)?	
	If the authors provide sufficient information to determine the concentration and units associated with the observed or calculated result(s), and clearly identify what form of the chemical the concentration is based on (e.g., metal salt vs metal form only) the answer is 'Y'.	
4.	Is the test media used in the study a natural or artificial soil?	
	Authors must report that the study was conducted using a natural or artificial soil. Studies conducted in pore water or any other aqueous phase (e.g., hydroponic studies), filter paper, petri dishes, manure, organic or histosoils (e.g., peat, muck, humus), are not considered suitable for use in defining soil screening levels.	
5.	Does the study report the organic matter content as ≤ 10% of the composition of the soil?	
	If the authors report that a standard (e.g., OECD) or commercially available artificial soil is used, but do not present the organic matter content, the answer should be 'Y' for the accepted artificial soil types listed in Table 1. *If the authors report that an EPA or OECD standard artificial soil is used, but do not present the organic matter content, the answer should be 'Y'* (OMC = 10%). **OR** *Organic matter content of the test soil must be reported by the authors, but may be presented in one of the following ways; total organic carbon (TOC), particulate organic carbon (POC), organic carbon (OC), coarse particulate organic matter (CPOM), particulate organic matter (POM), ash free dry weight of soil, ash free dry mass of soil, percent organic matter, percent peat, loss on ignition (LOI), organic matter content (OMC); see Table 1 for conversions;* **OR** *If the carbon and/or nitrogen content of the soils is reported by the author the response should be 'Y', because the organic matter content can be estimated; see Table 1 for conversions.*	
6.	With the exception of studies on non-ionizing substances, does the study report the pH of the soil, and is the soil pH within the range of ≥4and ≤ 8.5?	
	If the authors report that an EPA or OECD standard soil is used, the answer should be 'Y' (pH = 6).	

* Y = yes; N = no; U = unknown

No.	Criteria / *Detailed explanation of criteria*	Y/N/U*
7.	Does the study include control treatment(s)?	
	The control treatment must be comparable to the other treatments, and must be free of the chemical stressor. Appropriate controls include <u>baseline or background control</u> - parameters of actual or representative test species measured before and after administration of test chemical, though not as part of the same test scenario; <u>negative control</u> - organisms maintained under conditions identical to exposed organisms except for the absence of the test substance; <u>positive controls</u> - organisms maintained under conditions identical to the exposed organisms except the test substance is replaced with a substance known to elicit a consistent toxic response, and <u>solvent controls</u> - organisms exposed to carrier or solvent that is used as a vehicle for administrating the test substance to exposed organisms.	
8.	Was the duration of exposure reported, or was a standard study method indicating duration referenced?	
	If the authors report an exposure duration or refer to a standard references for details on duration used in the exposure (e.g., ASTM procedures, OECD guidelines) the response should be 'Y'. *If the authors do not present a duration for the exposure, but do refer to another reference as the source of the information, the answer should be 'U'.*	
9.	If the study was conducted in a laboratory setting, were at least three (i.e., control + two chemical exposure) treatment levels used in the study? If the study was conducted in a field setting, were at least two (i.e., control + one chemical exposure) treatment levels used in the study?	
	The authors must clearly state that a control and the appropriate number of treatments were used in the study or refer to a standard method that requires this exposure scenario as a minimum.	
10.	Are biological effects reported for ecologically relevant endpoints (ERE) (see Table 2)?	
	A calculated or statistically derived value must be presented by the authors, and the value must be associated with an ERE. This would include concentration response data associated with an ERE.	
11.	Is the scientific name, common name and/or variety or strain of the test species reported by the author(s)?	
	If the authors provide sufficient information to determine the species scientific name the answer is 'Y'.	

Table 1a: List of the pH and OM content of standard soils.

OECD 1984 Organization for Economic Cooperation and Development 1984
OECD 1993 Organization for Economic Cooperation and Development 1993
EEC Council of European Communities
ISO 1994 International Standard Organization 1994

Standard Artificial Soil Characteristics		
Soil Type	**Organic Matter**	**pH**
OECD 1984	10 % peat	6.0
OECD 1993	10 % peat	6.0
EEC	10 % peat	6.0
ISO 1994	10 % peat	6.0

Table 1b: List of the conversions for OM in soils

Organic Matter Type	Conversion
Total Organic Carbon (TOC)	Multiply by a factor of 1.72 gives the content of organic matter (6/99)
Particulate Organic Carbon (POC)	Multiply by a factor of 1.72 gives the content of organic matter (6/99)
Organic Carbon (OC)	Multiply by a factor of 1.72 gives the content of organic matter (6/99)
Carbon (C)	Multiply by a factor of 1.72 gives the content of organic matter (6/99)
Nitrogen (N) (Must have C:N ratio)	Convert ratio to %OC & Multiply by a factor of 1.72 to get the content of organic matter (6/99)
Carbon Particulate Organic Matter (CPOM)	Equivalent to OM
Particulate Organic Matter (POM)	Equivalent to OM
Loss on Ignition (LOI)	Equivalent to OM if reported as %, if not multiply by 100 for % OM
% Peat	Equivalent to OM, only for synthetic soils
Ash Free Dry Weight/Mass	Roman will send

Table 2: Ecologically-Relevant Endpoints

Effect Group Codes and Definitions for EcoSSL Tests

Ecologically Relevant Effects	DEFINITION
BEH	**Beh**avior: a general term characterizing overt activity of an organism. represented by three general categories: avoidance, general behavior, and feeding behavior Examples of ERE's associated with behavioral responses include avoidance to food, chemical, stimulus, light and/or water and changes in food consumption rates.
GRO/DVP, GRO	**Gro**wth: a broad category which encompasses measures of weight and length and includes effects on development and growth. Examples of ERE's associated with growth and development responses include change in body weight/length, developmental changes such as emergence to adult stages, emergence from cases, maturation plant curvature, loss of canopy, deformation, membrane damage, desiccation/change in water content, dormancy measures, change in flowering, injury, seed emergence, changes in senescence, shoot length/growth, root elongation/growth, fresh mass, and yield.
BCM/BCM ENZ, HRM	**B**io**ch**e**m**ical: measurement of biotransformation or metabolism of chemical compounds, modes of toxic action, and biochemical responses in plants and animals including three effect groups - chemical, enzyme and hormone effects. For the purposes of developing Eco-SSLs, only plant studies will have ERE's associated with biochemical responses. Examples include changes in photosynthesis, changes in chlorophyll content, changes in fluorescence, chlorosis, and change in carotene content.
MOR	**Mor**tality: measurements and endpoints where the cause of death is by direct action of the chemical. *Effect* measurements of death include an actual count of the number dead or the percentage reduction within a population as a result of the exposure while an *endpoint* such as the LD50 estimates the effects to the population. Examples of ERE's associated with mortality include time to death studies, counts of mortality/surivorship, and immobility.
POP	**Pop**ulation: measurements and endpoints regarding a group of organisms or plants of the same species occupying the same area at a given time. Measurement includes population dynamics - changes over time. Examples of ERE's associated with population include changes in size and age class structures, changes in sex ratio, population change over time, population growth rate, survivability of subsequent generations, biomass or weight for total population, live mass, diversity, evenness, index to population size (count, number, abundance), life table data, number of animals per population, and population density (number/area), primary productivity, standing crop biomass, CO_2 uptake, oxygen release, germination rates, population growth, intrinsic rate of increase, and biomass / abundance in relation to time.

Ecologically Relevant Effects	DEFINITION
REP	**Rep**roduction: measurements and endpoints to track the effect of toxicants on the reproductive cycle. Examples of ERE's associated with reproduction include changes in reproductive behavior, abnormal progeny, fecundity, number of offspring produced, hatching rates/success/viability, reproductive success/capacity (e.g., offspring/adult/week), change in pupation, change in cocoon production, number of cocoons produced, clitella development, sexual development, dormancy measures, germination, parthenocarpy, seed mass, change in sex expression, and sterility.

Endpoint Codes and Definitions for EcoSSL Tests (note that BAF/BCF reviewed by TG3)

ATCN **A**symptotic **t**hreshold **co****n**centration: The concentration of a chemical at which some percentage of a population of test organisms is in a state of approximate homeostasis for some prolonged period of time.

ECxx xx% **E**ffective **C**oncentration: Effective concentration for xx% of tested organisms.

EDxx xx% **E**ffective **D**ose: Effective dose for xx% of tested organisms.

ET50 Median **E**ffective **T**ime: Median time to effect or estimated mean survival time.

ICxx **I**nhibition **c**oncentration: concentration of the inhibitor required to give xx% inhibition of enzyme activity under specific conditions

LCxx **L**ethal **c**oncentration to xx% of test animals

LDxx **L**ethal **d**ose to xx% of test animals

LETC **Le**thal **T**hreshold **C**oncentration: Toxicity curve asymptotic concentration indicating an incipient LC50 value. Acute lethal action has essentially ceased.

LOEL **L**owest-**o**bservable-**e**ffect-**l**evel: lowest dose (concentration) producing effects that were significantly different (as reported by authors) from responses of controls

LTxx **L**ethal **t**ime, median: time required for xx% of a population to die from a given dose; also reported as "STxx" - survival time for xx% of a population

NOEL **N**o-**o**bservable-**e**ffect-**l**evel: highest dose (concentration) producing effects not significantly different from responses of controls according to author's reported statistical test

EcoSSL Ecologically Relevant Group Effect, Effect and Measurement Codes and Definitions
These are the currently available effect measurement codes that apply to the above defined ERE's. As new codes are defined, this list will increase.

BEH Behavior

AVO Avoidance effects

Measurements

CHEM	chemical avoidance	STIM	stimulus avoidance
FOOD	food avoidance	WATR	water avoidance

FDB Feeding behavior effects

Measurements

FDNG	feeding behavior	FCNS	food consumption
FEFF	feeding efficiency	WCON	water consumption
FTIM	feeding time		

BCM Biochemical (plants only)

BCM Biochemical effects

Measurements

CARO	Carotene	CLRS	Chlorosis

GRO Growth

GRO Growth effects - specific to invertebrates

Measurements

LGTH	Length changes (SITE=BOD)	(SITE=BOD)
WGHT	Weight changes	

DVP Developmental effects - specific to invertebrates

Measurements

GDVP	Development, general
EMRG	Emergence

GRO/DVP: Growth and development effects - specific to plants

Measurements

DFRM	Deformation	NPOD	Pods, number of
BMAS	Dry or Fresh mass,yield		
HGHT	Height	**under PHY:**	
LGTH	Length	SENI	Senescence induced
MATR	Maturation	SENR	Senescence retarded
SIZE	Size		

MOR Mortality or Survivorship

MOR Mortality effects

Measurements

HTCH	Hatch	SURV	Survival
MORT	Mortality		

POP Population

POP Population effects

Measurements

ABND	abundance (number of org/area)	NCHG	population change (change in N/change in time)
BMAS	biomass or weight for total population	PGRT	population growth rate
CVER	Cover - loss of canopy		
DVRS	diversity		
INDX	index to population size; count, number, abundance		

REP Reproduction

REP Reproductive effects - specific to invertebrates

Measurements

ABNM	Abnormal	RPRD	Reproductive capacity
PROG	Progeny counts/numbers	RSUC	Reproductive success (general)
WGHT	Progeny weight SITE=PRG		
RBEH	Reproductive behavior changes	TPRD	Total production

REP **Reproductive effects - specific to plants**

Measurements

FLOR	Floral Induction	SEXE	Sex expression Change
GERM	Germination		
PRTH	Parthenocarpy	**under PHY:**	
SEED	Seed Mass/Number/Yield	DORI	Dormancy Induction
STRL	Sterility	DORB	Dormancy Break Increase